UNIVERSITY OF TAMPERE
School of Management

CUSTOMER UNDERSTANDING IN THE FUZZY FRONT END OF INNOVATION

Management and Organizations
Master's Thesis
May 2017
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ABSTRACT

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Name:	Connecting with the customers. Customer understanding in the fuzzy front end of innovation
Thesis:	70 pages, 4 appendices
Key words:	customer understanding, latent needs, new product development, values, fuzzy front end, practice-based view, knowledge

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The purpose of the study is to understand how organizations can connect with their customers already in the early phases of innovation. Understanding latent customer needs is important for organizational success. Customer understanding is organizational knowledge about the customers, their needs and wants, as well as an understanding about what the organization can do for the customers (Nordlund 2009). Customer understanding is constructed in the early and chaotic stage of new product development, in the fuzzy front end. As the phase shapes the overall direction of the innovation process, the key for successful new product development is understanding latent customer needs already in the fuzzy front end. (Koen et al. 2001; Kim & Wilemon, 2002.)

This study is a case study that offers a snapshot on the values and rationalities behind an organization's customer understanding in the fuzzy front end. By understanding the similarities and differences in values and rationalities shaping both latent customer needs as well as customer understanding, we can better understand how to connect the two. The theoretical frame of this study builds on several discussions in the fields of innovation research, marketing research, organizational studies and sociology. It combines a practice-based view to knowledge with the theoretical discussions about values and rationalities. Combining these lines of thought offers an opportunity to examine organizational customer knowledge from viewpoints not widely addressed in the current literature.

The data was collected by using empathic research method, and the underlying values and rationalities were being interpreted by using an interpretational framework. According to the instrumental case study, the case itself is secondary, and facilitates of the study of something else. In this study, the instrumental case refers to the differences between two bodies of knowledge, the customer understanding and the latent customer needs.

The results of this study imply that connecting with the customers in the fuzzy front end is more than sharing the same values and rationalities. In this study, the organization's customer understanding in the fuzzy front end is mainly based on norms. However, the customers base their everyday practices, and thus latent customer needs, equally on values, rationalities, as well as norms. Emphasizing practice-based collaboration between organizations and the customers is important in the fuzzy front end, so that the nature of customer understanding can be built equally on values and rationalities, together with norms.

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1 INTRODUCTION

1 The background of the study

Knowing the everyday needs of the customers, identifying their needs and understanding their everyday realities is in the heart innovation. Already over a decade ago, Lagrosen (2005, 424), stated, I quote, "successful new product development requires in-depth understanding of the customer, their situation, their needs, and their wants" (Ibid. 2005, 424). Thus, understanding the functional and emotional needs of the customer are seen as the cornerstones of successful new products (Kouprie & Visser 2009). In other words, the keys to connect with the customers lie in the organization's knowledge and understanding of these functional and emotional needs.

This knowledge about the customers is called customer knowledge. Customer knowledge is organizational knowledge about the customers and their perceived needs and values, shared by the different members of the organization, guiding the everyday decision-making and sense-making processes of the organization. Traditionally customer knowledge has been perceived as something gathered from and about the customers (Gibbert, Leibolt, & Probst 2002). However, due to a theoretical shift, the customers are now being perceived as active participants and active co-creators in innovation processes and value creation instead of being merely passive subjects that knowledge is gathered from (Appiah-Adu & Singh 1998; Prahalad & Ramaswamy 2000).

Customer understanding is a practice-based view into customer knowledge, that follows the theoretical shift in innovation literature. This theoretical shift on the customers' role has also changed how the literature perceives customer knowledge as a concept (Gibbert, Leibolt, & Probst, 2002; Lagrosen, 2005; Appiah-Adu & Singh, 1998). Due to this shift, the practice-based view into customer knowledge has been introduced as a new philosophical orientation (Nonaka & Takeuchi 2002). However, the practice-based view on customer knowledge has been studied only little in the context of the fuzzy front end (FFE) of new product development.

In this study, I use a practice-based orientation into customer knowledge to better understand how to connect organizations with their customers. I will do this by studying similarities and differences in their values and rationalities. Vargo and Lusch (2002, 2004) argue that to connect with the customers, the organizations should base their practices on the same values as the customers. Values are seen to guide the everyday practices of people worldwide (Scott 2008; Berger & Luckmann 1967). However, values are not always easy to communicate to others (Nonaka & Teece 2001). As values are constructed in everyday practices, they can be studied through the rationalities guiding people's practices (Berger & Luckmann 1967).

Connecting organizations and customers in new product development is extremely important in technology, especially in the field of education. The workforce is facing the "Fourth Industrial Revolution", as quoted by Professor Klaus Schwab in his book the Fourth Industrial Revolution (2017). Both human behavior, systems and societies are seen to be changing due to new ways of using technology, according to Schwab. This is a digital change that affects industries all around the world. (Ibid., 2017.) This digital change has been noticed also in education, and mobile devices, particularly smartphones, have been seen to be game-changers in supporting learning and growth in the changing global environment (Market Watch 2016; OECD 2015; Fu 2013). The OECD Director for Education and Skills, Andreas Schleicer has stated that more effective ways are needed to integrate technology into teaching and learning in school systems, for that educators need learning environments that support 21st century pedagogies and 21st century skills. To fully harness the potential of ICT [information and communications technology] in education, countries need to include teachers at the "forefront of designing and implementing this change", states Schleicer. (OECD, 2015.)

Globally, Education technology, referred as EdTech, is a rapidly growing global market with a projection to grow into a $252bn business by 2020 (Williams 2016). EdTech, has multiple definitions (Dessler 2016), and in this report, it is used to describe technological tools used for learning, such as software, applications, and different learning management systems. With a digitalization rate of only 2% (Market Watch 2016) David Brainbridge (2016) predicts EdTech as "possible the most profitable digitalized sector yet".

In Finland, the Finnish National Board of Education is highlighting digitalization in the national core curriculum, so that all students have equal possibilities to use needed digital skills in the future (Helminen 2014). However, this digital leap is a complex construct. Leena Pöntynen, the Senior Advisor at The Association of Finnish Local and Regional Authorities, highlighted the different meanings of the digital leap in a national television podcast, A-studio, in March, 2016. In one hand, the digital leap is an idea how to utilize new technologies, applications, and teaching materials. On the other hand, Pöntynen refers to the digital leap also as a change towards an operational culture where the student shifts into the center of teaching, and becomes an active actor in the learning process. (Niva, 2016.)

The purpose of the study is to understand how organizations can connect with their customers already the fuzzy front end of innovation, especially in EdTech. EdTech as a market has great potential not only financially, but also socially. Digitalization is changing the field of education, and mobile devices, applications, and digital teaching materials are playing a key role in this change. (Niva, 2016; OECD 2015.) Therefore, understanding the latent needs of teachers is important not only for organizational success, but also for the social impact these EdTech products have. The digital change in education can be supported by translating latent customer needs into everyday EdTech products. However, without connecting with the customers and understanding latent customer needs from the start, the new products organizations design for everyday use in education may not always meet the everyday requirements of the actual users, teachers.

Customer understanding is a practice-based view on customer knowledge that can help us to better understand the similarities and differences between an organization and its customers in a value level. Customer understanding is organizational knowledge constructed in everyday social interaction that constitutes of the underlying values and rationalities guiding the organizational decision-making processes. (Nordlund, 2009.) By understanding the nature of an organization's customer understanding in this phase, we can better understand how to connect organizations and customers through understanding latent customer needs already from the start.

Already in 2001, Zhang and Doll stated that: “Most projects don’t fail at the end; they fail at the beginning”. This study concentrates on understanding the differences in values and rationalities between an organization’s customer understanding and its customers in the fuzzy front end of product innovation. The frame of this study builds on several discussions in the fields of innovation literature, knowledge management, and marketing, together with organizational studies and sociology. Combining these discussions offers an opportunity to examine the subject from viewpoints that are not widely addressed in current literature. In this approach concepts such as values, rationalities, knowledge, language, together with different actors and contexts for action become interesting targets of research.

1.2 The purpose of the study

The purpose of the study is to understand how organizations can connect with their customers already in the fuzzy front end of innovation. To achieve this purpose, I ask:

> “How can organizations construct customer understanding to be in line with the latent customer needs in the fuzzy front end of innovation?”

The study includes three sub questions, which are elaborated on in order to give an answer to the main research question. The sub research questions are the following:

1. What values and rationalities an organization has?
2. What values and rationalities do customers have in using ICT?
3. What differences and similarities can be detected from these values and rationalities?

Answering to the sub research questions happens by interviewing an EdTech startup together with Finnish subject and class teachers. I will use both empirical and theoretical material; however, the emphasis is on empirical material. The study is executed as an empirical case study and it is based on the practice-based view on organizational knowledge.

I answer to the first sub-research question by detecting teacher values and rationalities from interviews about using ICT in teaching. The second sub-research question is answered by studying an organization's customer understanding by detecting values and rationalities from individual narratives collected from the members of the startup. The third sub-research question is answered by comparing the values and rationalities of the teachers and the startup, and by detecting differences in these values and rationalities. By analyzing these differences in values and rationalities, I contribute into the innovation literature by extending studies on practice-based view of customer knowledge to concern also the fuzzy front end of innovation in new product development.

1.3 Key concepts

In 1967, Peter L. Berger and Thomas Luckmann argued that knowledge is created in routinized social interaction. Thus, knowledge about the world, and the embedded values residing in these truths, are created in routinized, unquestioned, social interactions taking place in certain context. In other words, knowledge is extremely social, and dependent on the time and place it takes places. (Berger & Luckmann, 1967.) This practice-based view on organizational knowledge emphasizes social interaction as the creator of common knowledge and unquestioned truths.

Values, norms and rationalities are in the heart of knowledge. *Values* are concepts on the preferred or what is desired. Values also include the construction of the standards to what different structures and behaviors can be compared to. *Norms,* on the other hand, specify how things ought to be done, and they define legitimate ways to pursue different value ended options. However, the values and norms can be role specific: the perceived appropriate activities and goals can be tied to a specific social positions or particular individuals. There is also a social obligation to values, norms and action. (Scott 2008, 54–56.) This means that there are social expectancies tied into particular social positions or roles, such as what it is to be a teacher or a startup member.

Rationalities are different logics behind reasoning and sense-making. People agree on different types of reasoning to make sense of the surrounding world; we have different reasons why things are important, how we should live our lives, and what is important in life. These different rationalities have their own unique logics, as well as values and norms. *Justification* is the act of sense-making: reasoning why something is important, and different rationalities can be detected in these justifying actions. People justify their actions in everyday social interaction by arguments and explanations, thus, studying language is in the heart of studying, values, norms, and rationalities. (Boltanski & Thévenot, 2006; Berger & Luckmann, 1967.)

Customer understanding is a practice based view into organizational knowledge about the customers. Customer understanding does not only include intra-organizational knowledge about the perceived customer needs and desires, but also includes the perceived views on what the organization can do for the customer. Customer understanding does not only contribute to the customer knowledge literature by emphasizing the practice-based view to knowledge, but also by presenting future orientation, by establishing organizational perceptions on what an organization can do for the customer. (Nordlund, 2009; Gibbert, Leibolt, & Probst, 2002.)

The Business Dictionary (2016) defines customer as a "party that receives or consumes the products". However, the orientation to customers and the nature of customer knowledge has shifted towards a more active role in the literature. The shift in the customer orientation is promoted by the change in focus from the tangible goods to intangible goods, and is reflected in the research on knowledge management, marketing, and strategy. (Vargo & Lusch, 2004; Appiah-Adu & Singh, 1998; Gibbert, Leibolt, & Probst, 2002; Lagrosen, 2005.) Thus, customer orientation and the practice-based view supports this theoretical shift in orientation, for they support the opportunity to study latent customer values through different practices, and the opportunity to connect with the customers on the value level.

The fuzzy front end is an important part of an innovation process. The Business Dictionary defines innovation as "the process of translating an idea or invention into a good or a service that creates value". Innovations also involve the application of information and are based on the perceived newness by the customers. Incremental innovations are based on minor improvements

or adjustments to current technologies, whereas radical innovations make fundamental changes, seen as revolutionary. The difference between the two is the knowledge embedded into the product: the level of knew knowledge is smaller in incremental innovation whereas radical innovation is based on high levels of new information in the eyes of the customers. (Business Dictionary, 2016; Dewar & Dutton, 1984, 1422–1423.)

The fuzzy front end is an unclear and ambiguous innovation phase that includes multiple practices, such as identifying new opportunities, analyzing them, generating and selecting ideas, as well as concept and technology development. (Koen et al., 2001.) In the end of the front end, an organization is ought to have a clear product concept that will prevent them from doing costly mistakes regarding to market potential, required technical expertise, and overall costs (Kim & Wilemon 2002).

1.4 The structure of the report

This report consists of five chapters: Introduction, Theoretical standpoints, Conducting the research, Research results, and Concluding remarks. The structure of the report is presented in the Figure 1.

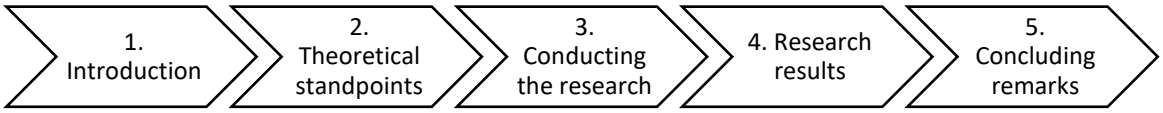


Figure 1. The structure of the report

The thesis is constructed as follows: In the second chapter a preliminary understanding is constructed for my reader about customer knowledge, together with values and rationalities. Furthermore, the chapter brings the discussion into the front-end context of innovation. The report combines marketing and innovation literature on customer knowledge, as well as literature addressing the nature and processes of organizational knowledge, and the special characteristics of the front-end phase.

In the third chapter the research strategy is presented, including the research philosophy, case study method, data generation, analysis and interpretation. Furthermore, the research process is presented with a simultaneous reflection on different choices.

In the fourth chapter the results of the study are presented. The values and rationalities of teachers and the startup are presented, and compared.

Finally, in the fifth chapter the concluding remarks are presented. First, a summary of the study is presented with conclusions. Second and third, theoretical contributions are analyzed with managerial implications. Last, the quality of the study is evaluated.

2 THEORETICAL STANDPOINTS

In this chapter, the reader is provided with an understanding of customer knowledge, values and rationalities, and the research context of fuzzy front end of innovation. First, the concept of customer knowledge from both marketing and innovation literature viewpoints is presented. Furthermore, it is argued that the paradigmatic shift into a more active customer role is present in both literature streams. Second, the interpretational framework by Boltanski & Thévenot (2006) is presented. Third, the fuzzy front end of innovation is presented. Last, a theoretical framework is constructed from these three components.

2.1 Customer knowledge

2.1.1 Customer knowledge in marketing

As the focus has shifted from value created by tangible goods into a perspective where value is created in processes and the goods are intangible, has also the views on customers, and therefore, also the perceptions about customer knowledge, shifted (Vargo & Lusch 2004a). This shift from tangible to intangible goods has been promoted by increased global competition, better informed and organized customers, as well as technological developments. All these together have changed how the managers perceive the global markets. In 1954, Drucker shifted the focus from describing commodities, institutions, and functions, to a focus on the customer. Creating satisfied customers was seen as a top organizational priority in marketing literature. Later on, the focus shifted from customers to markets, making the customer as an active value co-producer, highlighting knowledge as a competitive advantage, and promoting service perspective as a viewpoint also in product development. (Appiah-Adu & Singh, 1998.)

Stanley Slater and John Narver (1998) suggested that organizations can learn about customer needs by being market oriented. *Market orientation* is a management philosophy that represents a long-term commitment to understand the customers and their needs. These needs can be both expressed and latent. Market orientation is looking to produce superior customer value by

promoting innovation and innovative solutions. This management philosophy evaluates market information in a systematic way by studying the capabilities and plans of the competitors. Knowledge-sharing throughout the organization, long term focus, and generative learning are characteristics of a customer oriented business. By having this management philosophy, the organizations are able to generate innovations to meet the customer's latent and expressed needs, as well as have an organization culture hard to imitate and observe. Thus, market orientation is a competitive advantage on the markets. (Ibid., 1998.)

Because market orientation is an organization's cultural orientation towards customers, it consists of behavioral norms that guide the organizational learning and responses in an entrepreneurial manner for the superior customer value (Slater & Narver 1998). Recently, market orientation has been studied in new service development (Pascual-Fernández et al. 2016; Edvardsson et al. 2013; Matthing, Sandén & Edvardsson 2004), in relations to performance (Mac & Evangelista 2016; Hult, Ketchen & Slater 2005; Slater & Narver 2000), and from the viewpoint of customer involvement (Cui & Wu 2016).

Customer orientation is another viewpoint on gathering customer knowledge in marketing literature. The difference between market orientation and customer orientation is the timeframe of reacting to customer needs: customer oriented businesses react to already expressed needs, whereas market orientated businesses are looking to answer to latent customer needs. Thus, customer orientation relates to a responsive style of adjustment, and market orientation relates to a proactive way to adjusting to customer needs. The temporal focus of the two concepts are also different: customer oriented firms are looking customer needs from a short-term viewpoint, where market oriented firms are in for the long haul. Customer oriented firms learn by customer surveys, and they test different concepts based on that knowledge. Market oriented firms use customer observation to gain knowledge and they use continuous experimentation and selective partnering to understand how to produce long term customer value. Customer orientation is more based on producing customer satisfaction. In stable market conditions, customer orientation works well as a management philosophy. In more unstable and competitive markets, market orientation is more useful. (Slater & Narver, 1998.)

Service orientation promotes organizational learning as a way to strive in making better value propositions to the customers compared to the competitors. From this viewpoint, the communication and cooperation across boundaries both inside and outside the organization is an organization's core competency. The customer is in the center of service orientation. However, the orientation is driven by the market. This means adapting to the changing customer needs in a dynamic matter, as well as learning and collaborating with the customers. Service orientation as a perception combines organizational learning and market orientation. (Vargo & Lusch, 2002.)

Service dominant logic (SDL) is an extension of service orientation (Vargo & Lusch 2004a), that combines multiple disciplines to provide a richer foundation for the marketing discipline (Peñaloza & Venkatesh 2006). SDL has also been seen as a paradigmatic shift towards a more open approach towards value creation, that participates on the discussion of the sociology of knowledge and has a constructionist take on markets and value creation. (Peñaloza & Venkatesh, 2006.)

2.1.2 Customer knowledge in innovation

The innovation literature and marketing literature are highly intertwined. Fidel, Schlesinger and Cerrera (2015) provided a framework for collaborative competence that is based on multi-disciplinary theories. The research suggest that collaborative innovation is important for a firm's competitive advantages and that a collaborative competence is a primary determinant of a firm's ability to acquire knowledge for competitive advantages. Therefore, the researchers propose a model that connects three different theories: the resource based theory of innovation, service dominant logic from marketing, and customer knowledge management (CKM) from management literature. These theories provide a framework for measuring the effects of customer collaboration, innovation orientation and knowledge management on marketing results. The resource based theory of innovation measures innovation orientation, service dominant logic stands for customer collaboration, and CKM stands for organizational learning. Thus, innovation orientation, SDL and CKM are all reflecting different sides of collaborative competence. (Ibid., 2015.)

Current innovation literature highlights an open innovation approach. Lichtenthaler (2011, 77) defines open innovation as "systematically performing knowledge exploration, retention, and exploitation inside and outside an organization's boundaries throughout the innovation process". The degree of adoption of open innovation strategies depend on the firm's characteristics, technology considerations, and the conditions of the external environment, as these all affect the "organizational fit". The "organizational fit" is the extent to which critical firm characteristics, such as processes, structures, systems, and incentives, are in line with the conditions posing from the external organization. (Gianiodis, Ellis, & Seechi, 2010.)

Collaborative innovation with customers (CIC) is a current stream of open innovation literature and research (Greer & Lei 2012; Prahalad & Ramaswamy 2000). Organizations attain new knowledge and insights by working closely with customers and suppliers (Prahalad & Ramaswamy 2000) and customers are an active source of innovation both in NPD and in new services (Alam 2006; Lagrosen 2005). In collaborative innovation with customer's high levels of customer interaction is promoter in all stages of NPD (Lagrosen 2005), and the nature of customer interaction vary in different stages of NPD (Sawhney, Verona, & Prandelli 2005). Active customer participation is promoted also in collaborative innovation in NSD. Alam (2006) proposes a comprehensive guideline to improve success in the FFE of NSD, and high customer activity and input is promoted.

The viewpoint in perceiving customers as active participants in innovation took over in the shift of 21st century. Before this, the customers were perceived as a passive audience. (Prahalad & Ramaswamy, 2000.) Gibbert, Leibold and Probst (2002) connected different knowledge management systems with the different philosophical viewpoints they have on the customers and their involvement. The authors presented that customer relationship management (CRM) connects with learning *from* the customers, whereas knowledge management (KM) systems are concentrated on learning *about* the customers. (Ibid., 2002)

However, the authors proposed a third viewpoint on managing knowledge: *customer knowledge management*. In this viewpoint, the knowledge is collected directly from the customers, and customers are active value co-creators. Organizational learning, customer success, and

innovation are outcomes of this knowledge management approach, that sees customer knowledge as something that the customers have. (Gibbert, Leibold, & Probst, 2002.) It was for the learning orientation of the knowledge management viewpoint that Fidel, Schlesinger and Cerrera (2015) added customer knowledge management as a part of their framework. The authors argue that customer knowledge management is an important part of collaborative competence, for it comprises SDL and innovation orientation to knowledge application, such as local knowledge management systems, local abilities, and different know-how. (Fidel, Schlesinger, & Cerrera, 2015.)

"*If we only knew what our customers know*" is an axiom for CKM, whereas KM focuses on organization's own knowledge acquisition ("*if we only knew what we know*"), and CRM focuses on keeping the current sources of customer knowledge ("*acquisition is cheaper than retention*") (Gibbert, Leibold, & Probst 2002). As one can observe from the axioms, the viewpoints highlight different actors and viewpoints in the customer knowledge acquisition process. KM focuses on the organization's capacities to get customer knowledge, whereas CRM focuses on keeping the customers. However, Gibbert, Leibolt and Probst (2002) acknowledge that there are two kinds of knowledge: what we know, and what our customers know.

Table 1. Connecting knowledge management systems and customer knowledge orientations (Gibbert, Leibolt, & Probst 2002; Vargo & Lusch 2002; Vargo & Lusch 2004)

Customer Involvement	CKM	CRM	KM
Role of the Customer	Active	Captive	Passive
Focus	Customer Success; Innovation; Organizational Learning	Customer Retention	Customer Satisfaction
Orientation	Service Orientation	Market Orientation	Customer Orientation
Source of Knowledge	External	Internal	Internal
Rationale	Gain Knowledge Directly	Mine Knowledge from Databases	Integrate Knowledge Internally
Tools	Customer Experience; Practices; Co-operation	Database	Employees and the Internal Organization; Other Organizations

When connecting the work of Gibbert, Leibolt and Probst (2002) with the notion of service orientation being a new dominant logic in acquiring customer knowledge (Vargo & Lusch 2002; Vargo & Lusch 2004) can the different orientations on customer knowledge (service orientation, market orientation and customer orientation) be connected with customer knowledge

management approaches in innovation. As seen in Table 1, the three knowledge management approaches differ in their perspectives on the role of customer, as well as in their focus of management practices, marketing orientation, source of customer knowledge, rationalities, and tools. Thus, the paradigmatic shift from passive customers to active customers is present in both marketing and innovation literature.

2.2 Rationalities and values

Nonaka and his colleagues (2001, 14) quoted Plato when saying that knowledge is a "justified true belief". However, the authors also state that the emphasis is on the "justification" rather than on the "truth". (Ibid., 2001, 14). When thinking of knowledge as a practice, it can be seen as a justification process of own personal beliefs that are ought to be true (Nonaka & Takeuchi 1996). Thus, subjective truths, such as the views of right and wrong, as well as of good and bad, are negotiated in social interaction. This view highlights the social and negotiated nature of knowledge. (Berger & Luckmann, 1967.)

There are two types of knowledge, that differ in the forms in which they are communicated. Explicit knowledge is knowledge shared in data and expressed by words and numbers. From the practice based view of knowledge (Nonaka & Takeuchi 1996), explicit knowledge is only the top of an iceberg. The second type of knowledge is implicit: this tacit knowledge is not easily visible. For it is highly personal, it is hard to formalize, and be communicated with others. Tacit knowledge is rooted in actions and experiences, and in values, ideas and emotions manifested in them. Tacit knowledge is also rooted in beliefs, perceptions, mental models, and values taken for granted. This cognitive dimension of tacit knowledge shapes how we see the world. (Nonaka & Teece 2001, 319.)

Boltanski and Thevénot (2006) recognized that there are several forms of true beliefs. In their theory on justification the authors present six common worlds of justification. The worlds are an analytical tool to demonstrate tension between lines of argumentation that justify action (Boltanski & Thévenot 2006; Lehtimäki, Kujala & Heikkinen 2011):

1. *The Inspired World* welcomes change and the values highlights autonomy, creativity, and imagination. The worth in this world is in a being's capability to experience the inner state of inspiration, that is felt through different experiences. In this world, beings are appreciated by their uniqueness. Thus, understanding authentic relations is important.
2. *The Domestic World* highlights values such as respect, responsibility, and togetherness. This world drives on personal relationships, tradition, family values, and personal dependencies. Traditions and hierarchies are highly valued in this world.
3. *The Opinion World* bases its rationale on the worth that comes from the opinions of the others, and from the opportunity to communicate one's opinion. The presence in the public eye and the appreciation of the public opinion are important. Surveys are highly valued tools to measure the worth of things, and public reputation is also of importance.
4. *The Civic World* lines its rationality on the collectives instead of individuals. Membership that breaks isolation together with the aspiration to unify are seen to drive human dignity. Sacrificing individual interests serves the collective, and the rejection of particularity serves the collective act.
5. *The Market World* carries its rationale on customer, market value, competitive advantages, and other values where money can be used as a yardstick. Competition is a way of coordination and a price of an object converges desires into a monetary form. A person's value is defined by the degree of desires of others. Simplistically, if something is unwanted, it is also unworthy.
6. *The Industrial World* bases its lines of rationality and justification of actions with operational efficiency, technological expertise, and performance. Functionality of importance: when things are functioning well in the present, they work as a way to predict future. Harmony in this world is achieved in structures, in organizations of systems, that work together, are optimal, have no malfunctions, and are predictable.

By understanding the inner logic of a group, by understanding the lines of reasoning and justification, one can get access into the underlying values that are driving the everyday life of a group through justification (Boltanski & Thevenot 2006). By studying the act of justification,

one can access the values that the logic of reasoning behind it (Kujala, Heikkinen & Lehtimäki 2012). As values and rationalities are context and community dependent, must one acknowledge that due to these different contexts of action and different perceptions of actors, the values and rationalities of two groups are not the same (Boltanski & Thevénot 2006; Berger & Luckmann 1967).

Worlds do not represent groups, but arrangements of different objects to justify situations. By identifying situations, human beings know how to navigate in them. These ways of navigation arise from different worlds. Despite differing logics and values of the six worlds of justification, human beings manifest themselves in different worlds by agreements: agreements on identification of situations, how to act in them, and how objects should be arranged. (Boltanski & Thévenot, 2006, 2011.)

To get access to the latent customer needs, organizations must understand the unquestioned values, beliefs, and perceptions of the customers. However, as latent values are hard to express and go unquestioned, tacit knowledge and its latent values can be understood by studying practices. As practices can be seen as justification processes of tacit knowledge, understanding justification and its different rationalities is the key to understanding latent values. Thus, latent customer values can be studied by analyzing justification and its embedded rationalities.

2.3 The fuzzy front end

The uncertainty and the ambiguity of the front end of innovation has caused researchers to add the prefix “fuzzy” to the innovation phase (Zhang & Doll 2001, 97–98). However, this title has faced a decline in usage, as the mystification of factors affecting the front-end innovation has been seen unbeneficial for the definition of management practices and responsibilities taking part in the front end of innovation. (Koen et al. 2001, 46; Zhang & Doll 2001.) However, due to the creative nature of the phase with its conceptualizations, ideas and solutions it can be seen as a brain dump (Launch Leap 2015). Therefore, I use the concept FFE, instead of barely front end innovation, to highlight the ambiguous nature of the phase.

Innovations can be conceptualized based either on the area where the innovation is taking place, or based on knowledge. Based on the context of the innovation, there has been a distinction between product innovation and new product development (NPD) (Koen et al. 2001), service innovation and new service development (NSD) (Alam 2006), and product design and design innovation (Koupprie & Visser 2009). As innovation literature consists of vast bodies of literature coming from strategy, innovation, marketing, and information technology (Greer & Lei 2012), the language used differ between the disciplines. However, there are similarities as well as differences between these different areas of innovation. For example, even as NSD is closely related to NPD as a discipline, the development phases of these innovations cannot be transformed directly from one to another, as service innovation have different characteristics due to the unique nature of services (Alam 2006).

The phases of new product innovation are presented in the Figure 2.

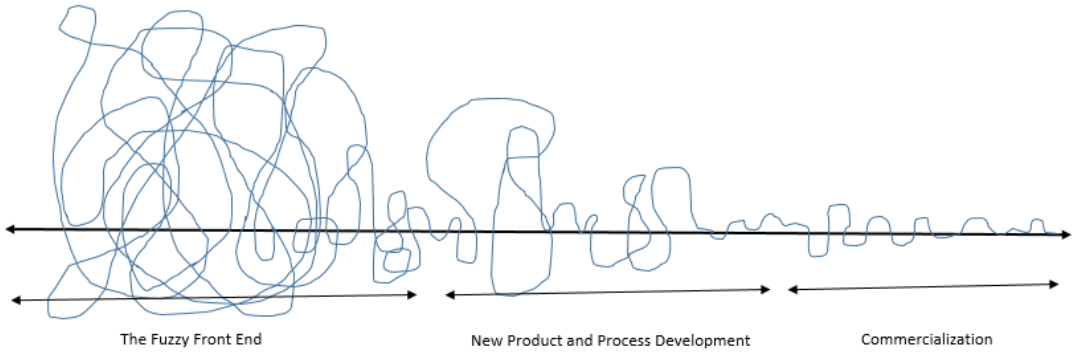


Figure 2. The phases of product innovation (Koen et al. 2001)

As presented in the Figure 2, the NPD process has three phases, from which the fuzzy front end is the first one. The second stage is called the product development and process development stage, and the final stage is called commercialization. (Khurana & Rosenthal 1998.) The fuzzy front end is the period of time between the notion of an opportunity, and the time when a product is considered to be ready for development. (Koen et al., 2001; Kim & Wilemon, 2002.) In the end of FFE, an organization is ought to have a clear product concept that will prevent them from doing costly mistakes regarding to market potential, required technical expertise, and costs (Kim & Wilemon 2002).

Khurana and Rosenthal (1998, 62) argued that common problems related to front end innovation are related to product definition, such as not understanding the user needs, unassessed markets, or continually changing requirements considering product features and technology. Leonard (2002) proposed that the majority of the relevant knowledge concerning the customer needs may be embedded in experiences, routines, and environments that are so obvious or unconscious that customers are not able to articulate them. Some problems can also be seen as normal from the customer perspective; thus, they are not thought as problems but as a part of normal reality by the customers. (Leonard, 2002; Leonard & Rayport, 1997.)

Based on knowledge, innovations can be conceptualized either as an absorptive capacity, that highlights the identification and utilization of external knowledge (Cohen & Levinthal 1990), or as an integration and refiguration of distinctive, heterogeneous bodies of different actors, that highlights the intra-organizational knowledge integration processes (Hislop 2003). The former highlights the internal-external distinction of knowledge and knowledge implementation, whereas the latter focuses on knowledge as practice based epistemology and innovation as the configuration and integration of different bodies of knowledge both inside and outside the organizational boundaries. (Hislop, 2003.)

The knowledge integration perspective to organizational knowledge and innovation highlight a theoretical shift in organizational epistemology from external-internal axis to intra-organizational processes (Hislop 2003). The practice-based epistemology and intra-organizational focus on organizational knowledge is linked with knowledge construction, creation and learning (Tsoukas & Mylonopoulos 2004), politics, power and the socio-material nature of knowledge (Callon 1984; Wæraas & Nilsen 2016), knowledge translation processes, and the sociology of knowledge (Wæraas & Nielsen 2016). In innovation context, the intra-organizational, practice-based view of knowledge is studied from the viewpoints of identity, resistance, socio-materiality, and networks (Harrisson & Laberge 2002).

However, the knowledge integration perspective is less studied in the context of product innovation and FFE. Studies in the FFE are either from the NSD literature (Alam 2006), are

based on the implementation perspective and different methods (Sawhney, Verona, & Prandelli 2005), or concentrate on the nature of customer relationship in the different phases (Lagrosen 2005). Thus, the organizational viewpoint on customer knowledge from a practice based view gives a fresh perspective to customer knowledge literature.

2.4 Synthesis: connecting tacit knowledge, material, and practice

In this chapter I will provide a synthesis of the studies reviewed in the previous chapters. The synthesis constitutes of three different parts. First, the link between practice, material, values, and different rationalities is analyzed. Second, customer understanding is presented as a practice-based view on customer knowledge. Third, the research setting is presented.

The intertwined nature of values, rationality, use of material and practices are presented in the Figure 3.

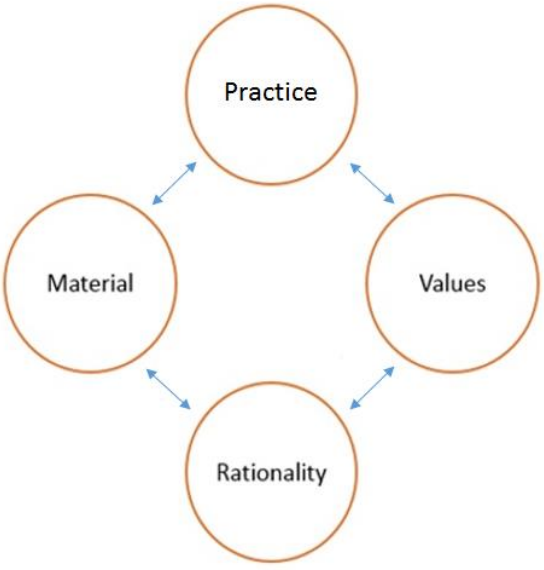


Figure 3. The practice based view to values, rationalities, and the use of material (Berger & Luckmann 1967)

As presented in the Figure 3, tacit customer knowledge is manifested in values (Nonaka & Takeuchi 1996), and is embedded in different practices (Berger & Luckmann 1967) these values can be studied through the justification of actions in a certain context (Boltanski & Thévenot 2006). The act of justification can be observed in rationalities. Rationality is the outspoken reasoning justifying actions that are based on values (Boltanski & Thévenot 2006; Nonaka et al. 2001; Berger & Luckmann 1967). How we understand the world is embedded into the language we use. From a practice-based view on knowledge (Berger & Luckmann 1967; Nonaka et al. 2001) we use language both to build and share our subjective views on reality with others: we construct our reality in social interaction with others, and language is the tool for it (Berger & Luckmann, 1967).

People construct tacit knowledge in different social actions and practices. This tacit knowledge is manifested in values and justified in different rationalities and outspoken reasons why. As these values and rationalities are embedded in different social actions and practices, the values and rationalities can be studied through the use of material. (Berger & Luckmann, 1967; Nonaka & Takeuchi, 1996; Boltanski & Thévenot, 2006.) As seen in Figure 3, the practice based view on values, justification, and material proposes that all is linked to social practices. Thus, values and rationalities are constantly under reconstruction for social interaction that takes place in certain context in a certain time: people reshape their knowledge and their views of the reality in everyday talks and other social interaction. (Berger & Luckmann, 1967; Nonaka et al., 2001.)

The three views on customer knowledge are presented in the Figure 4.

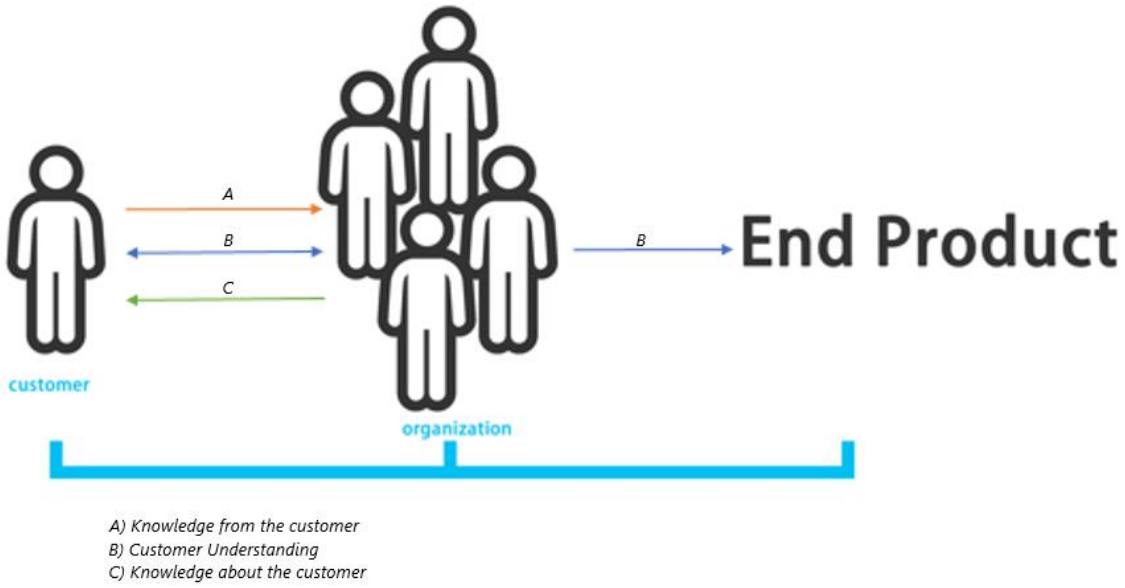


Figure 4. The three views on customer knowledge (Nordlund, 2009; Gibbert, Leibold, & Probst, 2002)

There are three views on customer knowledge that are presented in the Figure 4. The views are categorized by arrows indicating the direction of knowledge flow perceived in a particular view. Traditionally, there has been two views on customer knowledge: knowledge that a firm has *about* its customers, and the knowledge that is *from* the customer (Gibbert, Leibolt, & Probst 2002). A less studied concept in innovation literature is customer understanding. Customer understanding is an organization's construct on who the customer is, what are his or her needs, and what the organization can do to help the customer. (Nordlund, 2009.) The difference between customer understanding and customer knowledge, is in the future orientation. As customer knowledge presents organization knowledge from and about the customers (Gibbert, Leibolt, & Probst 2002), is customer understanding addressing also the perceived possibilities that the organization shares about how they can help the customers (Nordlund 2009). In other words, customer understanding is an organization's perception on what the customers want and need; something combining knowledge from and about the customers, and the objectives and possibilities of the

developing organization. In Figure 1, the arrow A demonstrates the knowledge that an organization attains from the customer. The arrow C illustrates the knowledge that an organization has about its customers. The arrow B shows how customer understanding as a theoretical construct combines these two views, and also holds a future orientation in the form of an end product solution.

Organizations can be seen communities of practice that negotiate their own views of particular knowledge, values, and views of the world (Hislop 2003). In the fuzzy front end, it is this shared group vision that clears the fuzziness of the phase (Zhang & Doll 2001). For customer understanding represents a collective organizational understanding of the customers and represents organizational knowledge, customer understanding is an useful construct to study organizational values from the practice-based view.

Studying values from a practice-based view is important, for there has been an orientational shift in the role of the customer. Evident in marketing, innovation and knowledge management literature, is that the epistemology of practice (Coock & Brown 1999) is present in the paradigms of SDL, CIC and CKM. In the change of organizational customer perceptions from passive to active co-creators, the role of the customer, and thus the concept of customer knowledge, has changed. However, it is not only the customer values that should be studied from the practice-based view. In order to connect with the customers, organizational knowledge and values are equally important.

In his article, Hislop (2003, 168) refers to Coock and Brown (1999) when presenting two conceptualizations of organizational knowledge based on the epistemologies of possession and practice: knowledge as an entity of possession that is shareable, and knowledge as something embedded in social interaction, shareable in teamwork. The knowledge integration methods used by firms in innovation varied based on this distinction. The firms practicing the epistemology of possession relied on formal communication, whereas the firms practicing the epistemology of practice believed in cross-functional teams and intensive teamwork. The firms following the epistemology of practice were successful in integrating tacit, local and conceptual knowledge,

whereas the firms following the epistemology of practice didn't succeed as well in implementing new knowledge. (Ibid., 2003.)

Customer knowledge is seen as a strategic resource for competitive advantage in marketing, innovation and knowledge management literature. However, the literature has concentrated either on the absorptive capacities (Cohen & Levinthal 1990), such as customer interaction processes (Alam 2006), methods for collaborative innovation with customers (Sawhney, Verona & Prandelli 2005), or the nature of customer relationship (Lagrosen 2005). The article by Hislop (2003) is one of the rear ones representing the intra-organizational knowledge integration processes alongside with the processes based on internal-external distinction of customer knowledge. This finding highlights that the intra-organizational viewpoint to organization's customer knowledge is a welcomed addition to the customer knowledge literature in innovation.

The Figure 5 presents an illustration of the research setting used in this study.

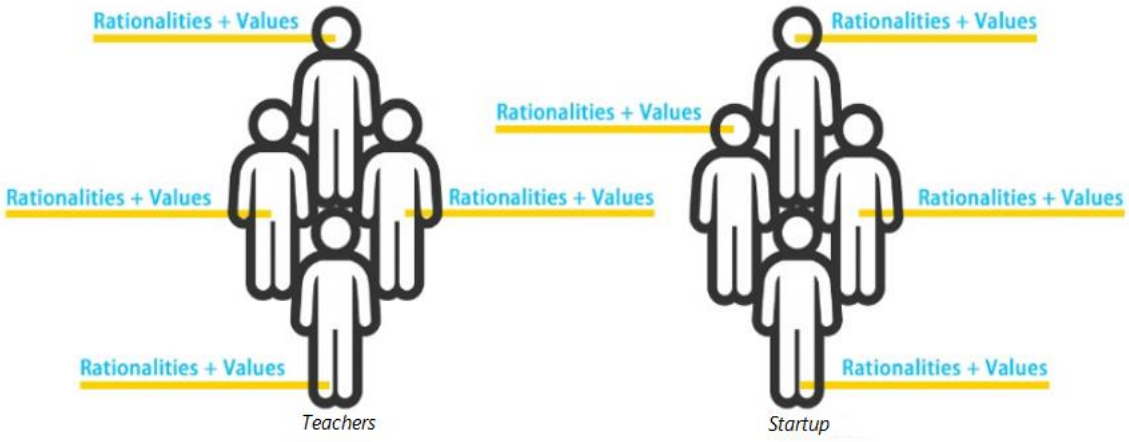


Figure 5. The research setting

The empirical study concentrates in understanding the differences in values and rationalities between an EdTech startup and teachers. As presented in Figure 5, knowledge is subjective (Berger & Luckmann 1967; Nonaka et al. 2001), and an organization's customer understanding consists of subjective perceptions on the customers, their needs, and individual views on the

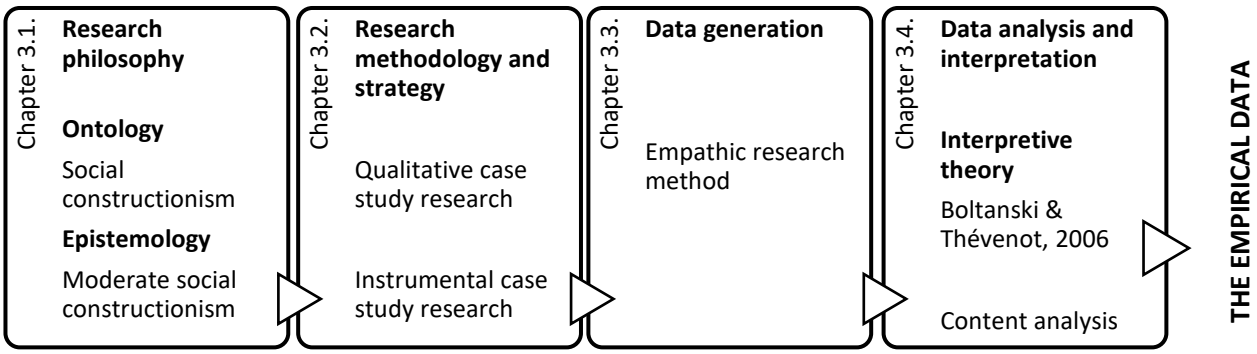
organization's abilities to answer to these needs (Nordlund 2009). To get access to the implicit knowledge containing the latent values and rationalities of the startup and the teachers, I take a narrative approach into the practices of using material. I use Luc Boltanski's and Laurent Thévenot's (2006) theory of the six worlds of justification together with the practice based view of knowledge (Nonaka & Teece 2001; Nonaka & Takeuchi 1996; Berger & Luckmann 1967) to analyze the empirical data.

Based on the literature review, my study contributes to the innovation literature in two ways. First, by using customer understanding (Nordlund 2009) as a construct in studying customer knowledge, the study brings a future orientation to customer knowledge based on action. Therefore, instead of merely stating customer values and the expectations about the future customer needs and wants, customer understanding includes an organizational perception of the solutions that can be offered. This view deepens the construct of customer understanding to also include perceived organizational limitations. Second, by studying the differences of different knowledge characteristics, I highlight the viewpoint of innovation as knowledge implementation between various bodies of knowledge (Hislop 2003). This brings the conversation about the sociology of knowledge (Czarniawska 2008; Wæraas & Nilsen 2016) to a product innovation context, especially to the FFE (Koen et al. 2001).

3 CONDUCTING THE RESEARCH

This chapter specifies the basic assumptions on which the research is based on, as well as describes the process how the research is conducted. As all research builds upon a set of theoretical presumptions that guide the research process, and there is no way to get access to the "truth", it is important to make the empirical research choices explicit (Eriksson & Kovalainen 2008, 12; Moisander & Valtonen 2006, 34). A summary of the philosophical and methodological choices used in this research are illustrated in the Figure 6.

Figure 6. Summary of the parts of the research process



The purpose of the study is to understand how organizations can connect with their customers already in the fuzzy front end of innovation. My research is exploratory by its nature and relies on theory-building (Yadav 2010). Thus, I am not on a journey to find an explanatory theory for the phenomenon, but to construct and elaborate new concepts and frameworks that can provide meaningful insights into the phenomenon (Moisander & Valtonen, 2006, 39).

3.1 Research philosophy

When discussing knowledge, such as customer understanding as organizational knowledge, one is faced with an ontological question of what do we ought to be real, and an epistemological question of how can we get information of the things that we ought to be real (Heiskala 2000, 82–84; Berger & Luckmann 1987, 13). Social constructionism aims to answer the ontological question of knowledge and reality by arguing that the meanings embedded in the knowledge of everyday life are based on practice and dialogue (Heiskala 2000, 90; Eriksson & Kovalainen 2008; 19-20).

Language is an important carrier of knowledge from the viewpoint of social constructionism. Language is perceived as a tool that enables sharing knowledge from one person to another. Social constructionist argue that for language is a carrier of knowledge, studying language, talk and stories can reveal a lot of the perceived reality that people share with each other. However, knowledge and actions are argued to be intertwined. Language and its embedded classifications are produced in social interaction within a group of individuals socially interacting and engaging in a certain context in a certain time. Language, with its embedded classifications, is a tool for people to share their knowledge on reality. In other words, the language we use to explain the world and to share knowledge is based on the routinized social actions we carry out in a certain context. (Berger & Luckmann, 1967; Burr, 1995.)

My assumptions in this research are attached to the ontology of social constructionism (Berger & Luckmann 1967), and the epistemology of moderate social constructionism (Järvensivu & Törnroos 2010; Närvänen 2013). The ontology of social constructionism highlights the social, and the practice-based nature of knowledge, and language as its carrier. The epistemology of moderate social constructionism allows community views of knowledge and supports methodological holism. Methodological holism focuses on social wholes, whereas methodological individualism tracks all social phenomena back to the actions of individuals (Heiskala 2001).

Moderate social constructionism as an epistemology supports my research in two ways. First, by supporting methodological holism and by acknowledging community views of knowledge it enables the comparison of two different bodies of knowledge. Furthermore, it shares the level of analysis in the thesis together with the interpretive framework by promoting social wholes as a level of analysis.

Second, moderate social constructionism offers transparency to the research process by including myself as a researcher also as a part of the study. For me to generate new knowledge on the research subject, I must recognize that I am at the same time attaching my research to a certain viewpoint on the reality, for knowledge is concept-dependent also in research. (Närvänen, 2013, 72.) These viewpoints of reality are called paradigms, and they are the commonly shared views of the world of science that influence how the research is conducted as a whole: the problem settings, the theories, the methodologies, and the interpretations. (Eriksson & Kovalainen, 2008, 10–17.) Thus, the philosophy behind the research is embodied in paradigms.

By adopting the ontology of social constructionism, I adopt the view that the reality is constructed differently by different groups of people (Berger & Luckmann 1967). Thus, not all people share the different realities. Therefore, the focus in my study is in understanding and offering different interpretations, as "the truth" is a subjective construct, not an objective state (Berger & Luckmann 1967).

3.2 Research methodology and strategy

The research method in this study is the qualitative case study research. Qualitative case study research is a research approach, where the interviews are perceived as an important source of data. Furthermore, the construction of a case is essential, and the research questions are always related to solving the case. Overall, the aim of the method is to interpret meanings, and get a holistic understanding of the case. (Eriksson & Kovalainen, 2008, 115–117.) Thus, the method supports the ontology of moderate social constructionism by highlighting the meaning of language as a source of information about knowledge.

Stake (2000) proposes three strategies to use case study research. First, an *intrinsic case study* is interested in understanding a particular case. Thus, the case itself is of interest. Second, an *instrumental case study* gives insights into another issue. Thus, the role of the case study is supportive, for it facilitates the study of something else. Thus, in instrumental case study, the case itself is secondary. Third, the *collective case study* promotes the study of multiple cases to understand a phenomenon, or a general condition.

In this study, I use *instrumental case study* research as a strategy to answer my main research purpose: how can organizations connect with their customers in the fuzzy front end of innovation. Thus, I construct the case in a way that it facilitates answering to the research purpose. To achieve this purpose my main research question is "How can organizations construct customer understanding to be in line with the customers in the fuzzy front end of innovation?". Therefore, the case is constructed based on the phase the organization is in, the fuzzy front end. Thus, as an instrumental case study, the study presents a snapshot of the organization's customer understanding in a certain phase of the innovation process.

3.3 Data generation

The data was generated in semi-structured interviews conducted in the spring and summer of 2016. For the startup members, the interviews were in digital form and conducted via e-mail. For the teachers, I used face-to-face interviews. The startup members were interviewed in English, for English was the official language of the organization. The teachers were interviewed in Finnish, and the interviews were transcript into English.

The startup was chosen to be a research subject based on its NPD phase and all startup members were interviewed. At the time of the interviews, the startup was shifting from developing its minimum viable product into presenting a demo that can be piloted in schools. Thus, from the NPD phase viewpoint the startup was in the fuzzy front end (Koen et al. 2001).
A summary of the six startup interviewees is presented in Table 2.

Table 2. Summary of the interviewees: startup

Startup Member	Education	Age	Sex	Date	Pages
A	M. Sci. Industrial Management	34	M	5.7.2016	4<
B	Vocational College	45	M	4.7.2015	<1
C	Bachelor of Business Administration	40	M	4.7.2016	1<
D	M. Sci. Economics and Business Administration	47	F	5.7.2016	<1
E	M. Sci. Software Engineering	44	M	4.7.2016	<1

The startup was founded by five people in 2016. The team had five years of experience in working together before turning to entrepreneurs. The customers in their previous industry were different, so in my study I presume that they have to create a mutual customer understanding (Nordlund 2009) from the start. As presented in the Table 3, two out of five of the startup members have a graduate degree in Engineering (A, E), whereas one has a graduate degree in Economics (D). One startup member has an undergraduate degree in Business (C), and one has Vocational Education (B). All of the startup members are aged between 30 and 50 years of age, and the majority of the members are men.

For the teacher interviews, I selected class and subject teachers from with different subjects, years of teaching, sex, and age. The teachers worked in both private and public schools, in different sized municipalities. All of this was to ensure rich description in the localized knowledge shared by these teachers. The summary of the teacher interviewees is presented in the Table 3.

Table 3. Summary of the interviewees: teachers

Teacher	Education	Subject	More	Years of Teaching	Sex	Age	School Funding	Municipality	School	Date
A	Class teacher	Arts Gymnastics	Substitute Principal Vice Principal	26	F	51	Public	Very Small	1	20.5. 2016
B	Subject teacher	English German Psychology	IT Support Person	13	F	39	Private	Very Big	2	12.5. 2016
C	Subject teacher	Biology Geology Health Education		10	F	39	Private	Very Big	2	12.5. 2016
D	Subject teacher	Finnish Drama		7	F	32	Private	Small	3	16.5. 2016
E	Subject teacher	Math Physics		10	M	42	Public	Very Small	4	9.5.2 016
F	Subject teacher	Theoretical subjects IT		7	M	40	Public	Very Small	1	20.5. 2016
G	Class teacher	Mainstream education		2	M	29	Public	Very Big	5	30.5. 2016
H	Class teacher	History Social studies	Vice Principal	38	M	63	Private	Very Big	2	12.5. 2016

As presented in the Table 3, the interviewees had different educational backgrounds, special work related responsibilities, years of teaching, sexes, and ages. The teachers worked in schools with different funding and in different sized municipalities. All these differentiating factors are presented in the top of the Table 3. The aim for a high variation in both teacher background and teaching context was to ensure a thick description. By interviewing teachers with different backgrounds and contexts, I aim to get access to different local knowledge.

As presented in the Table 3, I interviewed eight subject and class teachers from different provinces of Finland. Even as the interviewees were located in same provinces, they lived in different municipalities. To highlight the contextual differences of the teachers, I decided to categorize the municipalities based on their size (column 8): very small (<4000 residents), small (4000-9999), medium (10000-24999), big (25000-99999), and very big (>100000) (Statistics

Finland 2016). From the five schools, two were located in a very small municipality, one was located in a small municipality, and two were located in a very big municipality. Half of the schools were public and half of them were private.

I decided to limit my teacher interviews only to teachers with formal qualification as they represent the majority of teachers (OPH 2013, 65, 77). As presented in Table 3, all of the respondents worked in teaching different subject, besides the two vice principals (Teacher A, Teacher H). From the interviewees, two (Teacher B, Teacher F) worked with ICT either by teaching IT as a subject, or by operating as the school's IT support person. The English, Math, and Finnish language teachers were all represented in the study, but to get as rich data as possible, I didn't draw any focus on particular subjects. Half of the teachers were under 40-years-old, and the two vice principals were both over 50-years-old.

The data generation method in this study was empathic research method. Empathic research refers to a data collection method where the interviewees construct short narratives, following the instructions of the researcher. The method was chosen for it is based on the notion that people construct and relive their reality in stories (Saaranen-Kauppinen & Puusniekka 2006) and even the shortest of stories have a normative depth into them (Berger & Luckmann 1967). The empathic research method is used especially in studies where the purpose is to study representations, logics, or attitudes. (Saaranen-Kauppinen & Puusniekka, 2006; Tuorila, 2013.)

In empathic research the interviewees are often presented with a frame story (Saaranen-Kauppinen & Puusniekka 2006; Tuorila 2013). By presenting a story frame, the interviewees can construct a story on what had happened in the story before, or what will be the outcome. (Eskola & Suoranta, 1998.) Empathic research method allows researchers to acquire knowledge that is not grounded to the present, but addresses the future, and reveals the hoped states of reality (Eskola & Suoranta 1998). Thus, the empathic research method shares the normative future orientation together with the construction of customer understanding.

The frame story sent to the startup members is presented in the Figure 7.

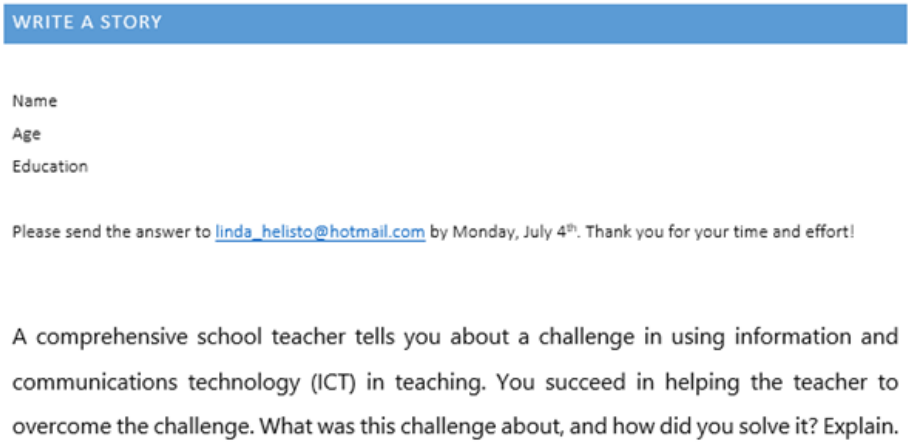


Figure 7. Screenshot of the frame story sent to the members of the startup

The five members of the startup were sent an e-mail in July 2016, where the frame story and the instructions were presented as a Microsoft Word document, as presented in the Figure 7. The startup narrated all stories in English, and it was also analyzed in English.

Usually, there are multiple varied frame stories that are delivered in a written form, so that the researcher can get access to different stories and analyze the differences and similarities that can be found between the varied stories in the text (Saaranen-Kauppinen & Puusniekka 2006; Tuorila 2013). For the startup members, I only used one frame story. A screenshot of the frame story sent to the startup members is presented in the Figure 6. First, as customer understanding (Nordlund 2009) is future orientated, I decided to frame the story around a certain context and a certain challenge. Furthermore, I decided to let the startup members define the perceived challenges of the teachers by themselves, for the challenges and their justification reveal what values the startup members perceive important for the customers. This will give a wider understanding of the organization's customer understanding. Second, there was no need to use multiple frame stories, for the purpose of the study is not to compare different answers between the startup members, but to get a holistic picture of the values and rationalities behind its customer understanding.

For the startup interviewees, I decided to use e-mail as a way to collect the written data, for the busy and fuzzy state of the NPD; as all the members of the startup were busy, I assumed that the opportunity to narrate a story from a mobile device or a laptop ether on the go, or from a desired location, would motivate the members of the startup to narrate a story. However, this choice limited my opportunity to ask follow-up questions. However, I assumed that through motivation, the narratives would present description thick enough for analysis.

For the teachers, I offered the opportunity to answer to multiple frame stories during their semi-structured interviews. The frame story for the teachers was the following:

> *"I am asking you to tell a story of a teaching situation where the use of ICT went well. The situation can be fiction or it can be based on your own experience. The story doesn't need to have a start or an end. Just tell me about a situation that in your opinion went well. Second, tell a story where ICT usage in teaching didn't go so well. You can reflect the situations through a positive or a negative lens, or through both."*

As the interviews took place just before the summer holidays, all possible interviewees let me know that they were busy. To make sure that I would get as descriptive data as possible, I chose semi-structured interviews, for it enables asking further questions about the stories as well as supported the interviewee's own perceptions through free speech (Saaranen-Kauppinen & Puusniekka 2006). Furthermore, face-to-face interviews and the opportunity to answer both frame stories were used to motivate the interviewees, as the lack of motivation to answer has been seen as a weakness to empathic research method (Saaranen-Kauppinen & Puusniekka, 2006; Tuorila, 2013).

3.4 Data analysis and interpretation

The intertwined nature of social constructionism and the interpretation of the case was present throughout the data analysis process. Thus, the steps of data analysis and interpretation were not following each other in a systemic matter, but different phases were returned into at different stages of the analysis and interpretation process.

The Table 4 presents the different phases of the data analysis and interpretation process.

Table 4. Steps of data analysis and interpretation

Step of the Analysis	Objective	Technique
Familiarization with the data	To create a holistic picture of the interviews; To transform the interviews to written form without losing information on the way	Transcript of the interviews
Recognition of rationalities	To analyze the interviews as entities and detect different rationalities by using the interpretational theory (Boltanski & Thévenot 2006)	Content analysis; Sentence as a unit of analysis; Analyzing subjects, objects, and verbs
Recognition of values	To analyze the interviews and recognize different values based on the detected rationalities of an interview.	Content analysis; Individual value profiles based on values and rationalities
Analyzing the case	To get a holistic understanding of the case; Answer the main research question	Content analysis; Categorize the detected values based on how they are used in argumentation
Answering the research purpose	To find out what the case was actually about	Content analysis

The analysis and interpretation of the generated research data was proceeded in five steps, as illustrated in Table 4. First, I familiarized with the data by transcription. Second, I recognized rationalities from both teacher and startup interviews, by using content analysis and a sentence as a unit of an analysis. Third, I recognized values from both the teacher and startup interviews by using content analysis, and built value profiles based on detected values and rationalities. Fourth, I analyzed values and rationalities by using category analysis. And last, I used content analysis to understand the case as a whole.

First, I transcript the teacher interviews. In qualitative research, the process of data analysis and interpretation are not separate from the generation of data. Nordlund (2009) refers to Gummersson (2005) when proposing that these processes are intertwined by their nature. Thus, I perceived the interview transcription process as a part of the analysis, for it worked as a starting point for creating a holistic picture of the interview data collected from the teachers. In this first step, I transcript the eight teacher interviews that varied from 20 minutes to nearly an hour. During this time, I familiarized myself with the teacher interviews by writing the transcript

myself. I transcript interviews into 80 pages of writing, including a teacher pre-interview to familiarize myself with the topic. The startup interviews were already in a written form so there was no need for transcription with that source of data.

Second, I used content analysis (Eriksson & Kovalainen 2008, 90) to analyze both teacher and startup interviews to detect rationalities. The aim for the qualitative content analysis is to form a description from the research phenomenon that can tie the results into a wider context (Tuomi & Sarajärvi 2002, 105). By analyzing the content in a way that it's grounded to the content itself, rather than into theory, I contribute to the already existing theory base, rather than test it. This inductive viewpoint into the research material means that the research is started from individual observations towards a wider argument – not vice versa. (Eskola & Suoranta, 1998, 83).

I chose content analysis for the second step, for the unit of my observation was sentences. Content analysis was used as an instrument to detect different parts of speech. (Eriksson & Kovalainen, 2008, 90.) These parts were verbs, subjects, and objects, together with adjectives and conditionals. I loosely detected objects, subjects and verbs, as well as adjectives, such as "*good*" and "*bad*", and conditionals, such as "*should*" and "*would*", from the text.

Detecting these different parts of an argument is important, for they are the building blocks of different rationalities. The common worlds by Boltanski and Thévenot (2006) are constraints that introduce the objective order of categories that govern the construction of a sound argument. This naturally perceived order is based on categories defining subjects, objects, qualifiers, and verbs. (Ibid., 2006.) as these that would help me recognize and categorize different rationalities. For customer understanding (Nordlund 2009) has a future orientation, I also detected adjectives to establish current desired outcomes, and conditionals to establish future desired outcomes. I then connected these two with the subjects, objects, qualifiers, and verbs detected from the text. Last, I categorized the interviews based on the rationality dominating the interview.

Third, I used content analysis to analyze the texts from a linguistic approach and the unit of observation was in interviews as a whole. When using the linguistic approach, the data is analyzed to investigate how reality is constructed in the interviews (Eriksson & Kovalainen,

2008, 91). In this step, I used Boltanski's and Thévenot's (2006) frameworks on six worlds of justification to categorize different values from the interviews. Using content analysis from a linguistic approach was essential, for the values were detected from the interviews, based on the characteristics of the rationality described by Thévenot and Boltanski (2006).

To answer to the first sub-research question, I used individual teacher values as sub-categories to get a holistic view on what values do teachers have in using ICT in teaching. Based on the rationalities and values detected in the steps two and three, I created individual teacher value profiles to guide my interpretation process. The teacher's value profile was constructed based on the teacher roles I interpreted from the interview, the purposes for using ICT in the present, the individual values detected from the interview, and the subjects of emphasis detected from the interview. The values find from individual teacher profiles were used as sub-categories, when connecting these individual categories into larger entities describing the values find from the teacher interviews as a whole. Teacher value profiles used in the overall interpretation process are find in the Appendix 1 and 3.

As I analyzed the teacher value profiles as a whole, I find that the teachers used the values in two different ways. The values were used to ether describe how things should be done, and what was done and why. I categorized the two ways of using values. I named the first category "efficient" used to describe how things should be done. I named the second category "effective" used to describe what should be done and why.

To answer to the third sub-research question, I created startup value profiles to help me to detect the shared values of organizational customer understanding in the FFE. I categorized the startup members based on the detected rationalities and values, using the same method as for teacher value profiles. However, for I find the two different ways to use values (efficient and effective), I used this finding to guide my interpretation process of the interviews. Thus, I created startup value profiles based on individual rationalities, values, and the categorization of these value dimensions of efficient and effective. The startup value profile used to help the interpretation process of the values behind organizational customer understanding can be found in the Appendix 3.

Fourth, I used thematic analysis (Eriksson & Kovalainen 2008, 219) to find concepts, ideas, and patterns of themes, as well as distinctions to form a holistic view on the teacher values, as well as startup values. I categorized individual teacher values to form a holistic understanding of the values teachers have in using ICT in teaching. I also categorized the individual values of the different members of the startup to form a holistic view of the values behind customer understanding in the FFE. I then compared these values based on the detected value dimensions of efficient and effective. These value dimensions are presented in the Appendix 2 and 4.

To answer into the third sub-research question, of why the rationalities and values of the teachers and the startup do not connect I cross analyzed the teacher value profiles, startup value profiles as well as the teacher and customer understanding values categorized by the two dimensions. Finally, the aim was to understand the collective case.

Next, I will present an example of the data interpretation process. This story is a transcript face-to-face interview with the teacher A. In this story, the teacher presents an example how the usage of a video in a final teaching project, held in an elementary school during the final studies to become a class teacher, was highly uncomfortable, for someone had altered the tape.

> *"I got into a situation where I was showing a history film in an elementary school and the content that came out was highly sexual. -- In a way, I was in a situation where I wasn't sure about the content that was showed on the TV. On the other hand, I am bit of a control freak -- I believe highly into planning and anticipation. It is dangerous for the students when someone endangers the way of doing in the group, by doing something surprising and impetuous."*
> (Teacher A)

As a, following question, I asked why this disruption of group hegemony is dangerous. My interpretation of the "way of doing" was normative, for in the example the teacher used was highly sexual content showed on TV. Therefore, I assumed it was the nature of the content, not the way of how the content was shown. The teacher answered, that:

> *"-- for I have been teaching for such a long time, I have experience about those parents who jump on you, when something not perceived as normal is done. A thing that is not a norm, [a thing] that the student has understood wrong, or hasn't understood at all. So, in the long run you will also face these [situations], and in a way, you want to develop your work, but you want to develop it in a generally accepted, positive flow. "*
> (Teacher A)

The example of a situation gone bad didn't address the use of ICT, even as it was the first story told in the interview. Before the example story, the teacher had addressed examples on how they were currently using ICT in teaching and the word "fear" came up a few times when addressing the content that the devices had access to. I brought this up, and the example story is an explanation to this fear of not managing the content when using ICT in teaching.

In the second step, I analyzed individual sentences, such as "-- *I have experiences about those parents who jump on you, when something not perceived as normal is done",* and detected subjects ("*parents*"), objects ("*I*"), and verbs ("*jump on you*"). As community was presented in multiple subjects, objects, and verbs by this teacher, I interpreted the rationality of the teacher to follow mainly the Civic World (Boltanski & Thévenot 2006).

In the third step, I analyzed the stories as a whole, and compared the findings with the primary interpretation based on the subject, objects and verbs. Thus, the third step was a comparative dialogue, where the new interpretation based on stories and examples as a whole, and the initial sentence based interpretations, were compared with each other, as well as with the theory. This technique was inspired by the grounded theory approach and the constant comparison method (Eriksson & Kovalainen 2008, 154-170), however in the overall scope, the study is not based on the grounded theory methodology. Rather, the study is more deductive by its nature and is guided by the categories of the six worlds of justification (Boltanski & Thévenot 2006) (See Lagrosen 2005, 428).

I used sentences such as "-- *in a way you want to develop your work, but you want to develop it in a generally accepted, positive flow"* to build a holistic view of the dominating rationality of

the interview. In the interview example, the rationality of the Civic World was evident in phrases as "*you want to develop it in a generally accepted, positive flow*", and *"I put my own interests aside and serve as a member of the team. If I start taking too many solos, others may get aggravated and it doesn't serve the team"* for the values of common purpose and altruism (Boltanski & Thévenot 2006). Based on an overall interpretation of the different examples and stories, the category of the Civic World was chosen and the values from the transcript were interpreted based on this logic (Boltanski & Thévenot 2006)

In this chapter I presented the five steps of data analysis and interpretation of the study. As the nature between the data analysis and interpretation process is highly intertwined, the presented steps are guidelines into the steps taken in different parts of the research process. The data analysis methods used in the study were content and category analysis, and the different viewpoints to analyze the data were presented through examples.

4 RESEARCH RESULTS

In this chapter, the results of the empirical analysis are presented. First, I present the prevalent teacher values and rationalities. Second, I present the prevalent values and rationalities behind the startup's customer understanding. Third, I present and analyze the two value dimensions perceived from the interviews.

4.1 Prevalent teacher values and rationalities

Table 5 represents the prevalent teacher values and rationalities perceived in this study. The values are categorized by the rationalities present in the interviews. However, not all values were represented in different rationalities. To create a more holistic view on the values that teachers have when using ICT in teaching, only values present in multiple worlds of justification are presented are analyzed in this chapter and presented in Table 5. Individual teacher values can be found from Appendix 1.

Table 5. Teacher values based on rationality

	The Industrial World	*The Civic World*	*The Inspired World*
Values	Format	Format	Format
	Communication	Communication	
	Skills	Skills	
	Groups	Groups	Groups

Based on the analysis, the teachers represent three different rationalities. These worlds of justification are the Industrial World, the Civic World, and the Inspired World. Five out of eight teachers represent the Industrial World, two represent the Civic World, and one represents the Inspired World. The values shared by all the tree rationalities are format, communication, skills, and groups.

First, the values shared by all interviewed teachers and interpreted rationalities, is form. From the Industrial World viewpoint, form is important, because it able fluent operations in the school environment. Based on the theory (Boltanski & Thévenot 2006) the correct form of operations is the one that ensures the optimal use of resources, and is thus a fit. The theory is supported, as teaching methods that ensures optimal operations and enable measurement were preferred by the teachers. Thus, personal practices are adjusted so that operations can be optimal, also when regarding measurement, as presented in the direct quote below from the Teacher E:

> *"Because the matriculation examination transforms next year – into a digital format, I guess I have to change into digital calculators."*
> (Teacher E)

Second, format for the Civic World teachers is important, for it enables a way to connect with others; by choosing a right format, the teacher can ensure that the recipient understands what he or she is trying to say. The format of communication in the Civic World is important both in student-teacher interaction and in peer-to-peer communication. Thus, the teacher uses communication formats that he or she believes to help the knowledge integration process. The communication form in the Civic World is labelled with altruism:

> *"I would put instructions in a video format, for the students' ability to read [instructions] is incomplete. They can't -- read in a way that [the content] would get understood."*
> (Teacher D)

In the direct quote from Teacher D, the teacher explains that even though doing things in a video format can be highly annoying for one, the motivation to do so is based on the recipient's way to understand.

Third, in the Inspired World, the format is important for it is a way to experience the unique nature of the surrounding world. Based on the theory (Boltanski & Thévenot 2006) it is the

understanding of uniqueness, that sparkles inspiration, and thus understanding uniqueness is promoted:

> *Me: "Why do you want to use a [real] branch [as an example], instead of showing a picture of a branch?"*
>
> *Teacher C: "It is the feel of it. The students can touch it, and for example try if the leaf is hairy. It is part of the characteristics. In a picture, you might not see it. -- I actually have stuffed animals at home -- but I don't have a biology class at the moment, where I would dare to leave them temporarily. That would be nice.*
>
> *Me: "Why the feel of things is important?"*
>
> *Teacher C: "Well now we get to the other sense. That beside the visuality is the touching sensory, how something feels. Same goes in preparation [biology], it is the doing and the experiencing."*

Visible in this direct quote is that to understand one's unique nature ("*the branch*") one must know the characteristics ("*hairy*") to identify it. This supports the theory's notion that in the Inspired World, the identification and the understanding of uniqueness is the base of human dignity. Therefore, identification by one's characteristics is important for through understanding uniqueness gives one access to authentic relations. The worth of a being lies in one's ability to experience inspiration. (Boltanski & Thévenot, 2006.) Therefore, the right form, based on the rationality of the Inspired World, is the one that supports the identification of uniqueness of the different elements of the surrounding reality.

The second value is communication. This value is represented in two rationalities out of three. First, in the Industrial World, communication is important, for it promotes efficient use of time. Thus, by communicating effectively and with thought, less misunderstandings will occur, and less time and effort are put towards clarifying a misunderstood situation. Following this rationality, misunderstanding is bad, for the use of time and effort are not optimal, and it does

not support the fluent operations in the school. Second, for the Civic World teachers, communication is important, for communication is a way to be an active member of the society. Thus, without communication, one is left alone and outside. This is undesired, for social isolation and the losing of actorship is perceived bad.

The third value is skills, and is represented by both the Industrial World teachers and the Civic World teachers. Skills are important in both rationalities, for correct skillset able a fit between an individual and the existing social structure. This fit carries the individual in the future and is thus important. Skills are acquired from education, and for Industrial World teachers it is important that schools teach students skills that will be desired in the work life of tomorrow. Such perceived skills are social and communication skills.

For the Civic World teachers, accurate skills are social interaction and communication skills:

> *"I would like my students to learn to be empathic people -- because when this happens, social interaction becomes easier and they [students] become talented."*
> (Teacher D)

As presented in the direct quote from the Teacher D, social skills are perceived as important for they make social interaction easier. In the Civic World, the ability to unify is important (Boltanski & Thévenot 2006), and for the teachers it happens through social interaction. Thus, without social interaction and communication skills, people are not able to connect, and therefore unify, with each other.

The fourth value, groups, is represented by the Industrial World teachers, the Civic World teachers, and the Inspired World teacher. First, for the Industrial World teachers, groups are desired for they enable peer-to-peer learning, which is seen efficient, for it saves time. This is supported also by Boltanski & Thévenot (2006) as large entities and well organized sub groups promote efficient use of resources. For Industrial World teachers, time was seen as an important resource in teaching. This viewpoint is present in the direct quote below by Teacher B, where

the teacher describes a situation where peer-to-peer learning in deploying new tablets into teaching, ensured a more efficient learning situation, and thus saved time for the actual class:

> *"It was nice when, back in the days, we got new iPads and I had designed the deployment of the devices for the students from the mindset that we should take some time because these are new devices and the students haven't seen them before. And then I shared the devices after an introduction, and they [the students] didn't need any instructions, but started to use the devices. Let's say that 60% or 70% of the students knew how to use the devices due to prior usage. And the majority who knew then helped the 30% who didn't know. I saved good fifteen minutes from the class, when I originally thought that we would start from "now you open the device and [figure out] how it works".*
> (Teacher B)

Second, for the Civic World teachers, groups are important for they ensure a place to practice social skills. The sense of belonging is seen as an important part of groups. These findings are in line with the theory, as the desire to unify is the driving rationale in this world (Boltanski & Thévenot 2006). Third, for the Inspired World teacher, groups are desired, for they promote inspiring experiences and an opportunity for curiosity to thrive, as presented in the direct quote by Teacher C below:

> *"I like to execute tasks in pairs, because then [the students] can wonder about [things] in pairs."*
> (Teacher C)

Values are the desired or preferred concepts embedded and shared in routinized, everyday social interaction. Values construct the standards to what different things, structures and behaviors can be compared to. Rationalities, on the other hand, represent the logics behind reasoning and sense-making, and they can be studied through the act of justification. In this study, teachers share four different values when using ICT in teaching: form, groups, communication, and skills. The teachers justify actions based on three different rationalities: The Industrial World, the Civic World, and the Inspired World.

4.2 Prevalent startup values and rationalities

In this subchapter, I present the prevalent values and the rationalities detected from the interviews of the startup members. Table 6 presents the startup values based on the interpreted rationality of the overall interview. First, the startup values are analyzed by two categories emerging from the Theory of Justification by Boltanski & Thévenot (2006). The six values categorized to follow the rationalities of the Industrial World are analyzed first. After this, the two values categorized to follow the Inspired World, are categorized.

Table 6. Startup values based on rationality

	The Industrial World	*The Inspired World*
Values	Measurement	Format
	Progress	Connectivity
	Large entities	
	Resource allocation	
	User friendliness	
	Connectivity	
	Format	

Represented in the Table 6, one can find the rationalities shaping the organization's customer understanding listed on top, and the detected values shaping customer understanding named under them. Each value is categorized by the rationality it follows based on the theory of justification by Boltanski & Thévenot (2006). The organization's customer understanding is based on different rationalities but same values. This means that same values can highlight different aspects of customer understanding, for they are based on different rationalities.

The members of the startup represent two rationalities: The Inspired World, and the Industrial World. The first rationality, the Inspired World, is represented by one member, and the latter, the Industrial World, is represented by the rest five members. Overall, the startup members

present seven values: Measurement, progress, large entities, resource allocation, user friendliness, connectivity and format. Connectivity and format as values are desired both in the Industrial World, as well as in the Inspired World.

First, measurement is valued for the rationality of the Industrial World is based on choosing the optimal practices based on measurement (Boltanski & Thévenot 2006). This is evident also in the startup interviews, as meeting new guidelines promoted by the new national curriculum, is perceived important so that teachers can meet their targets. Thus, the ability to measure practices is a prevalent value in the startup:

> *"She links these objectives according to new curriculum to make sure all curriculum targets are met."*
> (Member A)

Second value important for the startup is progress. Progress is categorized to follow the rationality of the Industrial World, for progress promotes future orientation. Based on the rationality of the Industrial World (Boltanski & Thévenot 2006), progress means that the current practices are optimal. Thus, progress is desired for it tells about efficient use of resources, and for it has a strong future orientation. Third, the value of large entities is perceived important for it is seen as a way to be efficient in one's job. Fourth, resource allocation, such as the use of money and time, is important, for the logic dominating the Industrial World is to be as efficient when using resources as possible. Fifth, user friendliness is important for otherwise the product would not be in line with the personal competencies of the teacher:

> *"She was really happy about the outcome and thought that hopefully in future there will be even easier way to do this kind of things, to make her and other not so "techy" teachers life easier.",*
> (Member B)

The sixth value, connectivity, is perceived as important in the Industrial World, for it ensures seamless and efficient working regardless of place:

> *"She [teacher] says she wants to give homework to her students in a way students can check the homework anywhere – she [teacher] says she needs to edit the homework easily regardless location."*
> (Member E)

For the one interviewee representing the Inspired World, values such as format;

> *"--[students] go outside and take photos of nice things that they see--*
> *After [company solution], they [students] did not have to stay in the class and find pictures from Google"*
> (Member D)

and Connectivity are highly important;

> *"The children cannot use their own mobile phones and take photos outside because there is no one place to save the photos and share them --. After [the firm's solution], they did not have to stay in the class and find pictures from Google.".*
> (Member D)

As presented in the first quote by Member D, authenticity is perceived as important, for the interviewee puts higher value on self-taken pictures of the surrounding reality rather than on pictures delivered from outer sources. On the other hand, connectivity is valued for the aspect of sharing authentic material. The interview is categorized to represent the rationality of the Inspired World for two reasons. First, I interpret the opportunity to take photos as an aspiration for creativity and as well as an opportunity to understand the uniqueness of the world by exploration (Boltanski & Thévenot 2006). Second, even as the aspiration to share is present in the second quote by Member D, and the justification of actions could be argued to follow the rationality of the Civic World. However, it cannot be interpreted from the interview that sharing photos is motivated by the aspiration to unify (Boltanski & Thévenot 2006). Quite the opposite, things in the interview by the startup Member D are appreciated for themselves, and not for they gain

access to something else. For example, it is evident in the interview that sharing pictures is not perceived as a form of social interaction that could support social integration and unity, as it would be in the Civic World. Thus, I categorize the interview to represent the rationality of the Inspired World, where things are appreciated for themselves (Boltanski & Thévenot 2006).

In this study, the startup members present seven values: measurement, progress, large entities, resource allocation, user friendliness, connectivity, and authenticity. One value, connectivity, is shared by the two lines of justification present in the interviews, the Industrial World and the Inspired World. However, in the Industrial World, connectivity is something that enables efficient use of resources. In the Inspired World, connectivity is something that supports the everyday exploration and the creativity of the students.

4.3 Comparing the prevalent values and rationalities

The purpose of the study is to understand the nature of an organizations customer understanding in the fuzzy front end of innovation. By comparing the similarities and differences in the values and rationalities of the teachers and the startup, one can better understand why they do not connect. In this sub-chapter I compare the prevalent values and rationalities of the teachers and the startup.

The prevalent teacher rationalities in the interviews are the Industrial World, the Civic World and the Inspired World. The prevalent startup rationalities follow the sense-making of the Industrial World and the Inspired World. The value of format is the only value shared by both the teachers and the startup, and the value is represented in three worlds of justification. First, for the Civic World teachers a right format allows the teacher to get better understood and a right form is dependent on the context, thus the students being the other part of interaction. Second, for the teacher and startup member following the rationality of the Inspired World, format is important for its authenticity. However, for the Inspired World teacher format is important for it helps identification that reveals authentic relations. On the other hand, the startup member representing the Inspired World valued authenticity, but did not base this on identification.

First, the findings suggest that the same rationalities can be shared by two different groups without them sharing directly the same values. When comparing the prevalent values and rationalities of the teachers and the startup members, the first finding relates to the differences in values, but a similarity in rationalities. For example, the ideas of efficient resource allocation and optimal processes are underlining all of the values prevalent in the interviews following the rationality of the Industrial World. However, the subjects of what is desired vary between the two groups. In other words, the two groups share the same lines of reasoning about *why* the desired concepts, are important, even as the desired concepts themselves are different between teachers and the startup. Thus, the startup and the teachers shared same rationalities, without sharing directly same values.

The two value dimensions detected in this study are presented in the Figure 8.

Figure 8. Value dimensions and argumentation

Second, the study suggests that values can be used differently in argumentation. In this study, values were defined as desired concepts. When analyzing the case as a whole, I found that values were used in two different ways in argumentation: Values were used to answer to the questions of *what*, *why*, and *how*. These two ways represented two dimensions of using values in argumentation, and are presented in the Figure 8. The Merriam-Webster (2016) defines *efficiency* as a way of *being productive of desired effects*, for example to be productive without waste. On the other hand, to be *effective* is *to produce* a desired effect (Merriam-Webster 2016). When comparing the two definitions together, efficiency is a way how to do things (Merriam-Webster 2016; Boltanski & Thévenot 2016), whereas to be effective has a normative depth into it, for the production is aimed to have a "*desired effect*" (Merriam-Webster 2016). To be effective is to "*accomplish a purpose*" and a purpose is a "*desired result*" (Dictionary.com 2016). Thus,

efficiency is based on *how* things are done, and effectiveness is about *what* should be done and *why*. After this notion, I re-categorized the values based on two dimensions: Effective and Efficient. First, the dimension of Effective is for values used to describe *what* should be done and *why*. The dimension Efficient is for values describing *how* things ought to be done.

When comparing how the teachers and the startup members used values in their argumentation, the members of the startup preferred to describe *how* things should be done, whereas the teachers highlighted equally the answers also to the questions of *what* is desired and *why*. From the six members of the startup, two answered to all of the three questions in their argumentation. The rest four answered only to the question *how* in their argumentation. These categorizations of the detected values and their dimensions can be found in the Appendix 2 and Appendix 4.

In the last chapter, the concluding remarks are presented. First, there is a summary of the study, together with conclusions. Second, the theoretical contributions are presented. Third, the managerial implications are suggested. Fourth, the quality of the study is evaluated. Last, future research directions are suggested.

5 CONCLUDING REMARKS

This chapter summarizes and evaluates the study, presents implications and possible future directions. This chapter is constructed as follows. First, a summary of the study, together with conclusions are presented. Second, the theoretical contributions are presented. Third, the managerial implications are suggested. Fourth, the quality of the study is evaluated. Last, future research directions are suggested.

5.1 Summary of the study and conclusions

The purpose of the study was to understand how organizations can connect with their customers already in the fuzzy front end of innovation. To achieve this purpose, I asked:

> "How can organizations construct customer understanding to be in line with the latent customer needs in the fuzzy front end of innovation?"

The study included three sub questions, which were elaborated on in order to give an answer to the main research question. The sub research questions were the following:

1. What values and rationalities an organization has?
2. What values and rationalities do customers have in using ICT?
3. What differences and similarities can be detected from these values and rationalities?

The theoretical framework was based on the practice-based view on knowledge, that tied together values, rationalities, material, and practices. In other words, people manifest their values both when using material in their everyday practices, as well as when justifying these practices. Therefore, values can be studied through the justification of practices. Based on the literature, the values and rationalities of an organization are the base for its customer understanding. Customer understanding is commonly share organizational knowledge about the needs of the

customers, as well as a commonly shared perception on what the company can do for the customers. The research suggests that connecting with the customers from the start is essential for the success of the new product development process. In this study, I presumed that organizations can connect with their customers by understanding the customers' latent values and the reasoning behind them already in the FFE. Furthermore, I presumed that latent values can be detected by studying rationalities.

To answer to the first sub-research question, I used the theory of the six worlds of justification (Boltanski & Thévenot 2006) as an interpretive framework to interpret data and detect prevalent rationalities and values behind and organization's customer understanding. Empirically, I studied the values and rationalities shared by the six members of a Finnish startup working in the fuzzy front end of new product development in education technology. The members of the startup were interviewed in English by using empathic research method for data generation.

To answer to the second sub-research question, I used the theory of the six worlds of justification (Boltanski & Thévenot 2006) to detect rationalities and latent customer values. Empirically, I interviewed Finnish subject and class teachers by using the empathic research method to data generation. Theoretically, I used the categories of the theory as an interpretational framework, through which I interpreted the data.

To answer to the third sub-research question, I constructed value profiles based on my interpretation on the individual interviews for both the startup members and the teachers. I categorized the interviews based on the interpreted prevalent rationalities and values, by using the theory of six words of justification (Boltanski & Thévenot 2006) as an interpretational framework. After detecting prevalent teacher values and rationalities, I then detected values that were shared between two or more rationalities. This was done to create a more holistic understanding of the prevalent values amongst teachers. Last, I re-categorized the prevalent teacher and startup values based on how they were used in argumentation when justifying actions.

To answer to the main research question, I analyzed the case as a whole. The research suggests that organizations can construct customer understanding to be in line with the customers in the fuzzy front end of innovation by understanding the what, whys, and how's behind the customers' actions. Furthermore, the research suggests that in the FFE, organizations concentrate mainly to answering to the question *how*, whereas customers concentrate to all questions equally. To better answer to the research purpose and to understand how organizations can connect with their customers in the fuzzy front end of innovation I analyzed the main finding in reflection with the philosophical presumptions and the key concepts

Table 7. Three dimensions of knowledge

Three dimensions of knowledge	***Question***
Values *(Scott 2008)*	What
Rationalities *(Berger & Luckmann 1967; Boltanski & Thévenot 2006)*	Why
Norms *(Scott 2008)*	How

There were three knowledge dimensions found in this study: values, rationalities, and norms, presented in the Table 7. These three dimensions answer to the question what, why and how. The first dimension, *values*, answer to the question what. The second dimension, *rationalities*, answers to the question why. The third knowledge dimension found in this study is *norms*, and it answers to the question how.

The similarities and differences of an organization's customer understanding and customers based on the three knowledge dimensions are presented in the Table 8.

Table 8. The differences and similarities in knowledge dimensions

	Values	***Rationalities***	***Norms***
Customer understanding in the FFE of NPD	X	X	X
Customers	X	X	X

The values and rationalities of the customers and organizations have both similarities and differences. The two groups highlight values, rationalities and norms differently in their argumentation and sense-making processes and highlight some more than others. As presented in the Table 8, organizations in the fuzzy front end use norms more as a base for their customer understanding compared to customers who use values, norms and rationalities equally in their sense-making processes. The colors of the X's represent the depth of different dimensions interpret from the interviews. In other words, the organization's customer understanding is based more on norms describing how things ought to be done, and the rationalities describing why, more than direct, desired values. Thus, organization's customer understanding can be constructed to be in line with the customers in the fuzzy front end of innovation by concentrating also to the *what* and *why* dimensions in the customers' argumentation and sense-making processes into the organization's customer understanding.

This finding brings the conversation into the differences in the nature of the two bodies of knowledge, and the intertwined relationship between norms, values and rationalities. The most represented word of rationality in the organization was the Industrial World where the ways of allocating and using resources is in the heart of argumentation. Thus, the value ended options are connected to the ways of action. This may explain the organization's high emphasis on how things ought to be done, with a less emphasis of what are the direct desired outcomes and why they are desired for. As the different worlds have different emphasis on what the rationality is based on, for example ways of action, or type of experience and knowledge (Boltanski & Thévenot 2006), may the different rationalities have different emphasis on whether they promote more norms or values.

5.2 Theoretical contributions

The study has two theoretical contributions. First, customer knowledge has previously been studied in the FFE from a practice-based view mainly in service innovation literature (Alam 2006), and in empathic design literature (Koupprie & Visser 2009). Thus, by studying customer understanding in the FFE of innovation by using social constructionism and the act of justification as a theoretical frame, I contribute into the innovation literature by providing a

practice based view into customer knowledge, especially in the new product development context.

Second, the previous research suggests that comparing organizational knowledge with customer knowledge through practices would be beneficial, for it would help us to understand why organizational strengths become weaknesses (Gibbert, Leibolt, & Probst 2002, 468). Thus, by providing a snapshot on the differences between the practice based implicit knowledge and latent values between an organization and its customer, I contribute to the innovation literature by filling a gap.

Third, the study contributes to the innovation literature by concentrating on the nature of organizational knowledge. By combining the practice-based epistemology and intra-organizational focus I bring innovation literature closer to the studies on sociology of knowledge, networks and socio-materiality (Wæraas & Nielsen 2016; Tsoukas & Mylonopoulos 2004; Harrisson & Laberge 2002). This is important, for introducing different philosophical assumptions to innovation studies offers an opportunity to study the phenomenon from new viewpoints.

In her dissertation, Nordlund (2009) argues that organizations construct customer understanding in three different conceptual spaces. Thus, Nordlund highlights the individuals' and organizations own willingness to learn from and with the customers. This highlights the intra-organizational knowledge processes and integration (Hislop 2003). However, this study shifts the focus from the actors in the organization into the nature of knowledge residing in the organization.

5.3 Managerial implications

The main finding of the study is that organization's share the same rationalities with the customers, even as the two have different emphasis on values, rationalities and norms in their justification and sense-making processes. Thus, understanding how the customers are using values, norms and rationalities in argumentation is important. Answering to the questions of

what, why, and how is important part of organization's customer understanding. Understanding all of these dimensions contribute into the customer understanding especially in the FFE, as customer related fuzziness is a major factor in the start (Koen et al. 2001).

Based on this study, organizations should collaborate in different practices with their customers especially in the front end of innovation. As mutual collaboration is the most effective way for intra-organizational learning (Hislop 2003), organizations should use practice based collaboration methods when cooperating with the customers. Customers should also be asked to explain what they are doing, why they are doing it, and how they are doing it, to fully understand the value dimensions behind justification. However, questioning underlying implicit knowledge can cause irritation (Berger & Luckmann 1967). This way implicit part of knowledge, such as values, norms, and rationalities will come explicit through explaining practices. Thus, the nature of customer collaboration in the front end should be highlighted also in the FFE of NPD.

5.4 Evaluating the quality of the study

In this chapter I evaluate the quality of the study. The evaluation is based on trustworthiness and transparency (Eriksson & Kovalainen 2008, 290–294).

My personal access to schools and a personal connection to the startup played a major role in collecting the data. From the eight teachers, five interviewees were collected through direct contact: three worked in a school B, and two worked in a school A. For the schools A and B, the principals granted me the permission to interview the teachers. I myself am a former student of both of the schools, and I must recognize that this past can have an effect on the nature of information shared with me, and my perceived position as a researcher. I also gained access to the startup of the study through personal networks, and I must acknowledge that this informal nature behind my introduction with the members of the startup might have also affected the nature of information shared with me.

This insider position (Glesne 1999, 26–27) can gain me easier access to organizations for my personal understanding of the cultural norms of the organization and for my personal

relationships (Eriksson & Kovalainen 2008, 58). However, the challenge in the insider position concerns of what I as a researcher know intuitively, and what I know based on the research evidence (Ibid. 2008, 58). To avoid this bias, I reflected on my presumptions and made them explicit to myself during the research. First, I took a step back when interviewing the interviewees. I tried not to take a normative stand during the interviews, and participated only by nods to encourage the talk, and with accurizing follow up questions. This skill clearly evolved during the research process. Second, I tried to observe the textual empirical data from an outsider position (Eriksson & Kovalainen 2008, 58). I constantly reminded myself to observe the transcript data only from the analytical viewpoint of the interpretive theory and not to insert my own perceptions into the analysis of the data. However, evaluating this cognitive process behind the interpretation, was out of my reach.

The rest of the three teachers from the eight were collected by using snowball sampling method. Patton (1990, 182–183) describes this sampling method suitable when requiring access into unfamiliar organizations and individuals (Eeriksson & Kovalainen 2009, 52). However, I decided to use this sampling tool for its lightness: instead of contacting principals in official matter and gaining research access to the teachers through their superiors, with the snowball sampling method I could contact class and subject teachers directly through social networks and work better in line with their personal restrictions on time and space.

I must also acknowledge how the material elements may have affected the data collection. From the social constructionist viewpoint, the use and organization of material reflects the values and rationalities embedded to the action of the society (Berger & Luckmann 1967). I found that, at times, the physical surroundings created, in my perspective, a hierarchical positioning between me and the teachers. First of all, there was a large table that crossed one of the interview rooms, and I sat on the other side and the teachers on the other side. I felt that this positioning created a role conflict for me as a researcher: in a situation where I was hoping to act as a novice gaining access to information (Eriksson & Kovalainen 20068, 56–61), the physical space redirected me in an expert role by limiting the personal space between me and the interviewees and putting institutional artifacts, such as big tables, (Scott 2008) into the middle of social interaction. When

I moved to the same side of the table with the teachers, I myself felt interviewing more comfortable.

The lengths of the startup narratives varied a lot, from under one page stories to over four page longs. Thus, I must acknowledge the possibility of over analyzing especially the shorter narratives. Also, the natures of the narratives varied: some were written in a seemingly humorous matter, and some where written in a more analytic nature. As I base the categorizations on my personal interpretations, the categories do not reflect the interviewees' views on the subject. Thus, my personal interpretations of the texts and interviews may cause overlooking of some parts of the data.

By choosing the theory of justification (Boltanski & Thévenot 2006) as the interpretational framework, the study is based on the theoretical perception that the different worlds of justification are not based on groups, but situations. Thus, the worlds do not represent groups, but arrangements of different objects and people to justify situations. In other words, rationalities are situational. (Boltanski & Thévenot, 2006, 2011.) This supports the philosophical presumptions underlying the study, and supports the validity of the research (Saaranen-Kauppinen & Puusniekka 2006). In this study, people and objects varied a bit in the narratives constructed by the interviewees. However, the empirical study was based on the presumption that the objects and people in teaching situations where ICT is being used, are similar. Due to this controversy based on the data generation method, the reliability of the study must be highlighted.

Furthermore, based on social constructionism (Berger & Luckmann 1967) values, roles and norms can be role dependent (Scott 2008) I must acknowledge that the way of talking and using words can be situational. Thus, the interviewees could have narrated situations in a socially acceptable way. In other words, the values detected in this study might not represent real latent values, but the values that the person is ought to follow in a certain situation based on one's role.

Last, when discussing reliability, one must ponder on how both the nature of the study as well as the subject of the study affect the answers of the interviewees (Saaranen-Kauppinen &

Puusniekka 2006). In the time of the data generation, the teachers were undergoing a big change due to the change of the core curriculum: schools were adopting new practices and not all teachers supported the change. Thus, the cultural change and school level leadership might have affected the nature of narratives being constructed by the teachers (Sipilä 2014). For the startup, the nature of the data generation could have affected the nature of narratives written, as not all people communicate themselves as well as in speech as well as in writing.

Furthermore, in qualitative study all interviewees might not share the same constructs (Eriksson & Kovalainen 2008; Saaranen-Kauppinen & Puusniekka 2006). For example, when describing teachers, interviewees might categorize people based on their actions with children (teaching), and not based on their formal education (class teacher, subject teacher), as done in this study. Thus, this might affect the reliability of the values and rationalities connected with certain actors.

5.5 Directions for future research

The study suggests that organizations in the fuzzy front end of innovation and customers have different emphasis on values, rationalities and norms argumentation and sense-making: some emphasize more on the question how and what and the others concentrate equally on answering as well as to the questions what and why.

As the study is based on exploration, generalizations should be avoided to ensure the validity of the findings. Thus, justification and the values, norms and rationalities used in argumentation should be studied in the future by methodology triangulation. This way both qualitative and quantitative research methods can be used to study the research phenomenon.

The interpretational theory by Boltanski and Thévenot (2006) is based on mutual identification of actors in a certain context of action. In other words, the worlds of justification used for sense-making in a certain situation can change if the actors in the situation change, or not everybody identify the actors involved in a same way. For future research, customer understanding could be studied without interpretational theory by using narrative approaches, so that the values,

rationalities and norms could be detected without anchoring them to a certain context of action with certain mutually identified actors.

The teacher interviewees of the study were interviewed for their roles or positions in a school, as well as the startup members were interviewed for their company. However, Scott (2008) states, that there is a social obligation to values, norms and action. As the different rationalities of the worlds of justification are not stable elements nor subjective characteristic of a person or a group, but dynamic and changing elements dependent also on the mutual identification of actors and the context of action (Boltanski & Thévenot 2006), the emphasis should also be in these two. This study concentrated on detecting values and rationalities from narratives. For future research, concentrating also to the other actors present in certain situations and how they are identified can bring more understanding on the dynamic nature of values, norms and rationalities in organizational sense-making.

As the study is a snapshot on the organization's customer understanding in the fuzzy front end, future research should elaborate and study the nature of customer understanding also in the other phases of new product development. Understanding the processes how the customer understanding changes in the different phases of innovation, is an important part of understanding organizational knowledge and how it is constructed from a process viewpoint.

REFERENCES

Appiah-Adu, K., & Singh, S. (1998). Customer orientation and performance: a study of SMEs. *Management decision*, *36*(6), 385–394.

Arndt, J. (1985). On making marketing science more scientific: role of orientations, paradigms, metaphors, and puzzle solving. *The Journal of Marketing*, 11–23.

Berger, P., & Luckmann, T. (1967). *The social construction of reality: A treatise on the sociology of knowledge*. London: Penguin Press.

Boltanski, L., & Thévenot, L. (2006). *On justification: Economies of worth*. Princeton: Princeton University Press.

Burr, V. (1995). *Social Constructionism*. New York: Routledge.

Callon, M. (1984). Some elements of a sociology of translation: domestication of the scallops and the fishermen of St Brieuc Bay. *The Sociological Review*, *32*(1), 196–233.

Carson, D., Gilmore, A., Perry, C., & Gronhaug, K. (2001). *Qualitative marketing research*. New York: Sage.

Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative science quarterly*, 128–152.

Cook, S. D., & Brown, J. S. (1999). Bridging epistemologies: The generative dance between organizational knowledge and organizational knowing. *Organization science*, *10*(4), 381–400.

Cui, A. S., & Wu, F. (2016). Utilizing customer knowledge in innovation: antecedents and impact of customer involvement on new product performance. *Journal of the Academy of Marketing Science*, *44*(4), 516–538.

Czarniawska, B. (2008). *A Theory of Organizing*. London: Edward Elgar Publishing.

Eriksson, P., & Kovalainen, A. (2008). *Qualitative methods in business research*. New York: Sage.

Eskola, J., & Suoranta, J. (1998). *Johdatus laadulliseen tutkimukseen*. Tampere: Vastapaino.

Fidel, P., Schlesinger, W., & Cervera, A. (2015). Collaborating to innovate: Effects on customer knowledge management and performance. *Journal of Business Research*, *68*(7), 1426–1428.

Foucault, M. (1970). *The order of things: An archaeology of the human sciences*. London: Tavistock.

Fu, J. S. (2013). ICT in education: A critical literature review and its implications. *International Journal of Education and Development using Information and Communication Technology*, *9*(1), 112.

Gianiodis, P. T., Ellis, S. C., & Secchi, E. (2010). Advancing a typology of open innovation. *International Journal of Innovation Management*, *14*(04), 531–572.

Gibbert, M., Leibold, M., & Probst, G. (2002). Five styles of customer knowledge management, and how smart companies use them to create value. *European Management Journal*, *20*(5), 459—469.

Greer, C. R., & Lei, D. (2012). Collaborative innovation with customers: A review of the literature and suggestions for future research. *International Journal of Management Reviews*, *14*(1), 63–84.

Heiskala, R. (2000). *Toiminta, tapa ja rakenne: kohti konstruktionistista synteesiä yhteiskuntateoriassa*. Helsinki: Gaudeamus.

Hislop, D. (2003). Knowledge integration processes and the appropriation of innovations. *European Journal of Innovation Management*, *6*(3), 159–172.

Hult, G. T. M., Ketchen, D. J., & Slater, S. F. (2005). Market orientation and performance: an integration of disparate approaches. *Strategic Management Journal*, *26*(12), 1173–1181.

Järvensivu, T., & Törnroos, J. Å. (2010). Case study research with moderate constructionism: Conceptualization and practical illustration. *Industrial Marketing Management*, *39*(1), 100–108.

Khurana, A., & Rosenthal, S. R. (1998). Towards holistic “front ends” in new product development. *Journal of product innovation management*, *15*(1), 57–74.

Kim, J., & Wilemon, D. (2002). Focusing the fuzzy front–end in new product development. *R&D Management*, *32*(4), 269–279.

Koen, P., Ajamian, G., Burkart, R., & Clamen, A. (2001). Providing clarity and a common language to the" fuzzy front end". *Research Technology Management*, *44*(2), 46.

Kouprie, M., & Visser, F. S. (2009). A framework for empathy in design: stepping into and out of the user's life. *Journal of Engineering Design*, *20*(5), 437–448.

Lagrosen, S. (2005). Customer involvement in new product development: A relationship marketing perspective. *European Journal of Innovation Management*, *8*(4), 424–436.

Lehtimäki, H., Kujala, J., & Heikkinen, A. (2011). Corporate Responsibility in Communication Empirical Analysis of Press Releases in a Conflict. *Business Communication Quarterly*, *74*(4), 432–449.

Leonard, D. (2002). Tacit knowledge, unarticulated needs, and empathic design in new product development. *Knowledge management–classic and contemporary works*, 22–37.

Leonard-Barton, D. (1995). Wellsprings of knowledge: Building and sustaining the sources of innovation. *University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship*.

Leonard, D., & Rayport, J. F. (1997). Spark innovation through empathic design. *Harvard business review*, *75*, 102–115.

Lichtenthaler, U. (2011). Open innovation: Past research, current debates, and future directions. *The Academy of Management Perspectives*, *25*(1), 75-93.

Lusch, R. F., Vargo, S. L., & O'Brien, M. (2007). Competing through service: Insights from service-dominant logic. *Journal of retailing*, *83*(1), 5–18.

Matthing, J., Sandén, B., & Edvardsson, B. (2004). New service development: learning from and with customers. *International Journal of Service Industry Management*, *15*(5), 479–498.

Moisander, J., & Valtonen, A. (2006). *Qualitative marketing research: A cultural approach*. New York: Sage.

Mac, L., & Evangelista, F. (2016). The Relative Impact of Market Orientation and Entrepreneurship on Export Performance: Do We Really Know Enough?. *Journal of Global Marketing*, 1–16.

Nonaka, L., Takeuchi, H., & Umemoto, K. (1996). A theory of organizational knowledge creation. *International Journal of Technology Management*, *11*(7-8), 833–845.

Nonaka, I., & Teece, D. J. (Eds.). (2001). *Managing industrial knowledge: creation, transfer and utilization*. New York: Sage.

Nordlund, H. (2009). *Constructing customer understanding in front end of innovation*. Tampere University Press: Tampere

Närvänen, E. (2013). *Extending the collective consumption of brands.* Acta Universitatis Tamperensis 1478. Tampere: Tampere University Press.

Pascual-Fernández, P., López-Sánchez, J. Á., Reynoso, J., & Santos-Vijande, M. L. (2016). Innovativeness and Market Orientation as Forerunners of the New Service Added Value and Performance in the Hotel Industry. In *Rediscovering the Essentiality of Marketing*. 925–926. Springer International Publishing.

Patton, M. Q. (1990). *Qualitative evaluation and research methods.* New York: SAGE.

Peñaloza, L., & Venkatesh, A. (2006). Further evolving the new dominant logic of marketing: from services to the social construction of markets. *Marketing theory*, *6*(3), 299–316.

Prahalad, C. K., & Ramaswamy, V. (2000). Co-opting customer competence. *Harvard business review*, *78*(1), 79–90.

Reinertsen, D. G., & Smith, P. G. (1991). The strategist's role in shortening product development. *Journal of Business Strategy*, *12*(4), 18–22.

Sawhney, M., Verona, G., & Prandelli, E. (2005). Collaborating to create: The Internet as a platform for customer engagement in product innovation. *Journal of interactive marketing*, *19*(4), 4–17.

Schwab, K. (2017). *The fourth industrial revolution*. Penguin UK.

Scott, W. R. (2008). *Institutions and Organizations: Ideas and Interests*. New York: SAGE.

Seeck, H. (2009). *Johtamisopit Suomessa*. Helsinki: Gaudeamus.

Sipilä, K. (2014). *No Pain, No Gain? Educational Use of ICT in Teaching, Studying and Learning Processes: Teachers' and Students' Views*. Lapin Yliopistokustannus: Rovaniemi.

Slater, S. F., & Narver, J. C. (2000). The positive effect of a market orientation on business profitability: A balanced replication. *Journal of business research*, *48*(1), 69–73.

Slater, S. F., & Narver, J. C. (1998). Research notes and communications customer-led and market-oriented: Let's not confuse the two. *Strategic management journal*, *19*(10), 1001–1006.

Stake, R. E. (2000). Case Studies. In N. K. Denzin, Lincoln, Yvonna S. (Ed.), Handbook of Qualitative Research second edition (pp. 134–164). California: SAGE.

Tuomi, J., & Sarajärvi, A. (2002). Laadullinen tutkimus ja sisällönanalyysi. Helsinki: Tammi.

Tsoukas, H., & Mylonopoulos, N. (2004). Introduction: Knowledge construction and creation in organizations. *British Journal of Management*, *15*(1), 1–8.

Vargo, S. L., & Lusch, R. F. (2004). Evolving to a new dominant logic for marketing. *Journal of marketing*, *68*(1), 1–17.

Wenger, E. (1998). Communities of practice: Learning as a social system. *Systems thinker*, *9*(5), 2–3.

Wæraas, A., & Nielsen, J. A. (2016). Translation theory 'translated': Three perspectives on translation in organizational research. *International Journal of Management Reviews*. *18*(3), 236–270.

Yadav, M. S. (2010). The decline of conceptual articles and implications for knowledge development. *Journal of Marketing*, *74*(1), 1–19.

Zhang, Q., & Doll, W. J. (2001). The fuzzy front end and success of new product development: a causal model. *European Journal of Innovation Management*, *4*(2), 95–112.

Electronic References

Business Dictionary. (2016). Customer. Retrieved from http://www.businessdictionary.com/definition/customer.html [2.6.2016].

Dictionary.com. (2016). Effective. Retrieved from http://www.dictionary.com/browse/effective?s=t [17.8.2016].

Dictionary.com. (2016). Purpose. Retrieved from http://www.dictionary.com/browse/purpose?s=t [17.8.2016].

Helminen, J. (2014). OPS2016 – Koulu katsoo tulevaisuuteen. Tieto- ja viestintäteknologinen osaaminen laaja-alaisen osaamisen osana. Opetushallitus. Retrieved from http://www.oph.fi/download/156931_ops2016_tvt_osaaminen_laaja-alaisen_osaamisen_osana_itk2014.pdf [7.6.2016].

Launch Leap. (2015). How to co-design products in the front end design process. Montréal. Retrieved from https://launchleap.com/en/blog/2015/05/29/how-to-co-design-products [14.5.2016].

Market Watch. (2016). Global report predicts edtech spend to reach 252bn by 2020. London. Retrieved from http://www.marketwatch.com/story/global-report-predicts-edtech-spend-to-reach-252bn-by-2020-2016-05-25-4203228 [14.7.2016].

Merriam-Webster. (2016). Efficient. Retrieved from http://www.merriam-webster.com/dictionary/efficient [13.7.2016].

Merriam-Webster. (2016). Effective. Retrieved from http://www.merriam-webster.com/dictionary/effective [13.7.2016].

OECD. (2016). New approach needed to deliver on technology's potential in schools. Retrieved from http://www.oecd.org/education/new-approach-needed-to-deliver-on-technologys-potential-in-schoolstm [1.8.2016].

Opetushallitus. (2013). Opettajat Suomessa 2013. Retrieved from http://www.oph.fi/julkaisut/2014/opettajat_suomessa_2013 [18.10.2016].

Research and Markets. (2015). Education Technology (Ed Tech) and Smart Classrooms Market 2015 – Global Forecast to 2020 for the $93 Billion Market. Dublin. Retrieved from http://www.prnewswire.com/newsreleases/education-technology-ed-tech-and-smart-classrooms-market-2015---global-forecast-to-2020-for-the-93-billion-market-300138590.html [15.6.2016].

Saaranen-Kauppinen, A., & Puusniekka, A. (2006). KvaliMOTV - Menetelmäopetuksen tietovaranto. Tampere: Yhteiskuntatieteellinen tietoarkisto. Retrieved from http://www.fsd.uta.fi/menetelmaopetus/kvali/index.html [8.6.2016].

Tilastokeskus. (2016). Kunnan koko väkiluvun mukaan. Retreived from http://www.stat.fi/meta/luokitukset/vakilk/002-2002/index.html [14.9.2016].

Tilastokeskus. (2015). Esi- ja peruskouluopetus. Retrieved from http://www.stat.fi/til/pop/index.html [21.11.2016].

Tuorila, H. (2013). Method of empathy based stories. National Consumer Research Centre. Retrieved from http://www.vtt.fi/files/sites/sw2013/Method_of_empathy_based_stories.pdf [15.6.2016].

Williams, H. (2016). Global edtech market to hit $252bn by 2020. Retrieved from http://startups.co.uk/global-edtech-market-to-hit-252bn-by-2020/ [7.5.2017]

Other References

Niva, J. (21.3.2016). A-studio. Helsinki: Yle. [Television interview]

Appendix 1: Teacher value profiles

Teacher	World	Role	Purpose of ICT usage	Purpose of teaching	Values	Emphasis on	Example
A	Civic	Educator and sharer of generally accepted cultural knowledge and social skills.	For students to learn relevant knowledge in the cultural context in an inspiring way.	Clarifying the overall purpose of the collective.	Unity Unified function Altruism Own needs or wants put aside Communication skills Tools to act in the collective	**Managing knowledge** **Collectives** **Membership**	*"I put my own interests aside and serve as a member of the team. If I start taking too many solos, others may get aggravated and it doesn't serve the team."*
B	Industrial	Making efficient knowledge sharing possible amongst the students.	ICT is a tool to affect the learning situation and manage the social network created by the students in the classroom.	Teaching big entities. Empowering the students as knowledge sharers and experts.	Groups Good for peer learning and knowledge sharing Technical skills [teacher] Efficient use of the devices and applications for teaching Orderliness [communication] Anticipating before acting so that issues can be sorted out without misunderstandings	**Efficiency** **Time** **Expertiveness**	*"[It was a good situation] because it had true sharing, and the know-how spread in the network. [And] the peer learning and support [happened in] the social network. – it saved time that I didn't have to give advice [individually] to everyone."*

C	Inspired	Teacher provides experiences for students to get inspired and curious.	ICT is a tool to study the world as it is.	Providing authentic experiences.	Senses Trigger inspiration Format The format of information should be as authentic as possible Experiences Inspiration is felt in experiences	**Experiences** **Understanding uniqueness**	*"[Transforming a text book into a digital form] is not the right usage of technology. It is [things] like visualizations, video clips, and quizzes. They are the right use of technology, not that I write and answer to a page."*
D	Civic	Teacher puts aside own preferred forms of teaching, and uses forms of communication that supports the understanding of the student.	ICT is a tool to communicate in certain forms of information, and to be a part of the global community and connect with others.	To teach children to be effective communicators who can express themselves, manage one's actions, and to participate in groups.	Communication skills Effective communication Groups Situations where skills can be acquired and used Format [communication] supports the understanding of the recipient.	**Effective communication** **Socio-emotional skills** **Participating**	*"I would like my students to learn to be empathic people -- because when this happens, social interaction becomes easier and they [students] become talented."*
E	Industrial	Teaching that maximizes the individual learning process.	ICT is a tool to support efficient learning processes individually.	Teaching aimed at a maximized ration between effort and utility in individual learning.	Individual learning Maximizes efficient learning Sketching Learning in an observable form Management The direction of the learning process Format [learning] Measurement	**Learning Process** **Measurement**	*"When they [students] move on by themselves, they can get more out of a teaching video, or when it [content] is presented in a different way, than when they [students] would read it from the book."*

F	Industrial	To help the student to find individual strengths as early as possible, because no one will end up doing things that they are not good at in the future.	ICT is a tool to teach the skills of tomorrow.	Teaching is a way to achieve the most effective ways for students to find their own strengths and learn the skills of tomorrow.	Motivation Drives personal actions, efficient learning Face-to-face Communication Prevents misunderstandings Strengths Carries in the future	**Responsibilities** **Applications of knowledge** **Future skills**	*"I like students to take as much responsibility as early as possible -- because they are more motivated when they can suggest things themselves, do it by one self, and do it in one's own way."*
G	Industrial	Helping students to find functional sets of competencies, so that when they graduate, they will be useful actors in the society.	ICT is a tool to help students to find their strengths and to help them to have the social skills of tomorrow. Without finding one's strengths one can't support oneself through work, be needed, and thus have a happy life.	Teaching is aimed to find individual strengths and teaching social skills so that the students will be part of the society and working life. When students take responsibility over their own learning, they learn skills that help them to function in the society through work.	Competencies Communication and personal skills Responsibilities Teaches skills The working life of tomorrow Good life constitutes of being needed professionally Large entities Support the global world view of today	**Efficient usage of financial and psychological resources** **Strengths** **Skillsets**	*"[Finding one's own strengths is important] for everyone should know where they are good at -- so that they would find different emphasizes at an early age. – In a way that the crediting of one's own skills and know-hows would be stronger already in this [early] phase. It guides a lot their post-graduation study decisions."*
H	Industrial	Teacher lifts inspiring phenomena to attract the	ICT is a tool to inspire student so that they would be	Teaching is aimed to attract curiosity, so that the	Responsibility [teacher, situational] Manage the teaching situation and the	**Potential** **Action Responsibility**	*"Curiosity carries in the future."*

		curiosity of the students.	curious about things and phenomena.	individual's full potential can get into use.	content so that curiosity can occur Curiosity	**Future**	

Appendix 2: Teacher values based on two value dimensions

Values	*Format*	*Communication*	*Skills*	*Groups*
Efficient *How*	*" I would put instructions in a video format, for the students' ability to read [instructions] is incomplete. They can't -- read in a way that [the content] would get understood."* *(Civic; Efficient)*	*"Maybe I've been talking about them [cases of special needs children] because they have so much communication. And the type of communication where misunderstandings can occur."* *(Industrial; Efficient)*	*"In a way, I think that we should concentrate on what the student can do, instead of what the student can't do. I don't think that it's relevant for all to know math on a certain level, it is not relevant. I think it is more relevant that, during the elementary school, the student would learn the things where he or she is really good at and would develop them. -- Because when the student leaves the elementary school, no one is doing thing that they are not interested about, or particularly good at."* *(Industrial; Efficient)*	*"I like to execute tasks in pairs, because then [the students] can wonder about it in pairs."* *(Inspired; Efficient)*
Effective *What Why*	*"For example, I [use] microscopes, preparations, these kinds of experimental methods. They are also visual. Microscopes are visual. And in the cases of species recognition it is the absolutely the last option to observe them [the species] from some black-and-white drawings -- it is completely wrong."* *(Inspired; Effective)*	*"I see that digital devices and ICT -- enhances social interaction and communication between people. -- The purpose for them [digital devices and ICT] is to make it easier to understand the world and to act in it."* *(Civic; Effective)*	*"[Finding one's own strengths is important] for everyone should know where they are good at -- so that they would find different emphasizes at an early age. – In a way that the crediting of one's own skills and know-hows would be stronger already in this [early] phase. It guides a lot their post-graduation study decisions." (Industrial; Effective)*	*"Of course, it is the core of every education that a human learns to manage one's actions and to operate in a group."* *(Civic; Effective)*

Appendix 3: Startup value profiles and value dimensions

Member	World	Values	Efficient: How	Effective: What + Why
D	Inspirational	Authenticity	*"--[students] go outside and take photos of nice things that they see-- After [company solution], they [students] did not have to stay in the class and find pictures from google" (Efficient; Inspirational)*	
		Continuity	*"--from now on, it was possible to actually run longer and more interesting drawing projects with the children." (Efficient; Inspirational)*	*"The children cannot use their own mobile phones and take photos outside because there is no one place to save the photos and share them --. After that [the firm's solution], they did not have to stay in the class and find pictures from Google." (Effective; Inspiration)*
A	Industrial	Format of teaching		*"Digitalization has offered her new ways to conduct teaching and she [the teacher] has successfully used object oriented teaching for her class a while already. Typically, she prepares a list of objectives she wants students to achieve in each week in each semester. She links these objectives according to new curriculum to make sure all curriculum targets are met." (Effective; Industrial)*
		Individual progress	*"—she [teacher] wants always to be easily approachable and make sure everyone is always progressing." (Efficient; Industrial)*	
		Large entities		*"Of course, she has received many feedbacks but creating overall summary at evaluation phase is challenging as also the feedback is scattered." (Effective; Industrial)*

		Time	*"One of the nicest things with [the product] is that Tina is able to get a jump start to lesson. When the class starts, she forces with the click of a button every tablet in the class to open a specific web page or app. This allows them directly to go to a specific learning content."* *"The sharing of the devices is now much easier in the beginning of the class. --* *If any of the devices for some reason is not working properly it can be detected with the solution and city IT support will come to take care of the device. Thus, the devices are working much better than earlier." (Efficient; Industrial)*	
E	Industrial	Connectivity	*"She [teacher] says she wants to give homework to her students in a way that the students can check the homework anywhere – she [teacher] says she needs to edit the homework easily regardless location" (Efficient; Industrial)*	
		Resource allocation	*"In addition to OneDrive, there are similar solutions like Google Drive, Drop Box, that she can choose from, and many offer storages for free" (Efficient; Industrial)*	
B	Industrial	User friendliness	*"She is not sure how to prepare, and share the assignments to the students. --* *We went thru how to make individual copies for all students and how to set the needed student access rights for those. She was really happy about the outcome and thought that hopefully in future there will be even easier way to do this kind of things, to make her and other not so "techy" teachers life easier."* *(Efficient; Industrial)*	
C		Time	*"She was educated how to utilize {the firm's solution] for her needs quickly and how to start the class utilizing digital assets efficiently and quickly." (Efficient; Industrial)*	

		User friendliness	*"Mrs. Henderson was introduced with [the firm's solution] MDM solution together with the change training. This give her capabilities to utilize ITC technology in a way that she needs it to be used"*	

Appendix 4: Startup values based on two value dimensions

Values	*Measurement*	*Progress*	*Large entities*	*Resource allocation*	*User friendliness*	*Connectivity*	*Authenticity*	*Continuity*
Efficient *How*		*"—she [teacher] wants always to be easily approachable and make sure everyone is always progressing." (Industrial; Efficient)*		*"—she [the teacher] was educated quickly how to utilize [the firm's solution] to meet her needs, and how to start the class efficiently and quickly by utilizing digital assets. (Industrial; Efficient)*	*"[the teacher] was introduced with [the firm's solution], together with the change training. This gave her capabilities to utilize ITC technology in a way that she needs it to be used" (Industrial; Efficient)*	*"She [teacher] says she needs to edit the homework easily regardless location" (Industrial; Efficient)*	*"--[students] go outside and take photos of nice things that they see – [and do] not have to stay in the class and find pictures from Google" (Inspired; Efficient)*	*"--from now on, it was possible to actually run longer and more interesting drawing projects with the children." (Efficient; Inspirational)*
Effective *What Why*	*"Of course, she has received many feedbacks but creating overall summary at evaluation phase is challenging as also the feedback is scattered." (Effective; Industrial)*	*Typically, she prepares a list of objectives she wants students to achieve in each week in each semester. She links these objectives according to new curriculum to make sure all curriculum targets are met." (Industrial; Effective)*	*"Of course, she [the teacher] has received a lot of feedback, but creating an overall summary for evaluation phase is challenging, as the feedback is scattered." (Industrial; Effective)*		*"Students are also motivated to use the digital devices in the class, and she [the teacher] feels that the students are learning more effectively. (Industrial; Effective)*	*"The children cannot use their own mobile phones and take photos outside because there is no one place to save the photos and share them." (Inspired; Effective)*		